

A Revision of *Congea* (Verbenaceae)

by

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INTRODUCTION

The genus *Congea* was established by Roxburgh in 1819 with one species *C. tomentosa* of which a coloured plate was published accompanied by a detailed specific description (*Pl. Corom.* III, p. 90, t. 293). The species was stated to be "a native of Chittagong where it blossoms in March."

Apparently Roxburgh had described under this genus three species in manuscript: *pentandra*, *villosa* and *tomentosa*, and the generic name *Congea* was a latin adaptation of the bengali (khasi) name "*Kungea*" for *Roscoea pentandra* from Silhet; but since in 1819 only *C. tomentosa* Roxb. was published, the remaining two did not acquire any status except much later. This means therefore that as published in 1819, *Congea* must be typified on *C. tomentosa* which was based on a specimen from Chittagong. In describing the "Germ" of this species, there is an implied reference to other manuscript species, thus: "subturbinate, etc. etc. exactly as in the former species"; but since the two "former species" (*pentandra* and *villosa*) were not published in 1819, this reference has to be ignored.

Roxburgh in *Fl. Ind.* III (1832) 54–57, ignored the valid name *Congea* and adopted *Roscoea* with *R. pentandra*, *R. villosa* and *R. tomentosa* as the three species, overlooking the fact that *Roscoea* Roxb., even if it were not a later homonym of *Roscoea* Smith (1804, Zingiberaceae), would have been a later synonym of *Congea*.

It is probable that Roxburgh had from the very beginning adopted the name *Roscoea* and not *Congea* for the genus; but since a long delay in publishing the genera and species submitted by Roxburgh in 1791–1794 for *Plants of Coromandel* III (1819) had made *Roscoea* Roxb. unusable for a verbenaceous plant as it was taken up in 1804 by Smith for a zingiberaceous genus, Sir Joseph Banks or Dryander might have discarded *Roscoea* to create *Congea* which could be legitimately used for Roxburgh's genus. Such a procedure, we learn, was followed in the case of *Roxburghia*. Since the readers were given no clues that the editor had made such a change, severe criticisms were levelled at Roxburgh (then already deceased) for having followed a procedure regarded unethical by botanists in naming a genus after his own self. (De Theis, *Glossaire de Botanique* 1810, p. 407). It is only

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in the rejoinder given that it was revealed that Dryander, under Sir Joseph Banks's direction, had substituted the name *Roxburghia* for Roxburgh's *Stemona* Lour., because the latter was totally a different plant from Indo-China (Wight & Arnott *Prodr. Ind.* I, 1834, pp. XIV–XV).

The latter view seems to be correct since, according to Sealy (*Kew Bull.*, 1956 pp. 324 & 377), Roxburgh's plates of the three species concerned are all named in manuscript as the species of *Roscoea*, even the one that was published in 1819 under the name of *Congea tomentosa* Roxb.

Naturally, Carey who was interested in publishing Roxburgh's *Flora Indica* as written by the author, and who probably was unaware of nomenclatural change made in the genus, retained *Roscoea* unaltered. But whatever may be the reason for adopting *Congea* in 1819, the generic type remains the same, *C. tomentosa* Roxb.

Both the description of *Congea* (1819) and that of *C. tomentosa* (1819) are reprinted in Roxburgh's *Flora Indica* III (1832) 54–57 under *Roscoea* and *R. tomentosa*, with a few minor editorial changes in the specific description; and though it is re-stated that the species is a native of Chittagong "where it blossoms in March", a new paragraph has been added at the end of its description, stating: "a native of Coromandel, where it flowers in the cold season". This additional information being somewhat contrary to the original one which makes the plant a native of Chittagong, must have been misplaced here and may have been intended for the species that follows, i.e. *Clerodendron phlomoides* Willd. which was wild in Coromandel. Clarke who revised *Congea* and the allied genera for Hook. f., *Fl. Br. Ind.* IV (1885) 602–604, makes no mention of any *Congea* specimens from the Coromandel Coast. In fact the entire genus seems to be confined to what may be called the Indo-Malayan region extending from the Khasya Mountains southwards through Burma and Thailand to Malaya and Sumatra and eastwards across the frontiers of Vietnam or Indo-China to the south-western parts of China. It has not been recorded wild so far from Borneo and Java; and it is wholly absent from West Bengal and the Indian Peninsula except as a cultivated plant.

Confusion over Roxburgh's Species

There is a good deal of confusion over the identity of the two Roxburgh's species *Congea tomentosa* and *Roscoea villosa*; and without clinching their identity, the status of the other species and varieties described during the period of over fifty years following the publication of Roxburgh's *Flora Indica* III (1832) remains uncertain. This confusion may be considered here under three aspects: (1) Objective difficulties, because there are inherent in the plants themselves; (2) the types and plant geography; and (3) early interpretations of the species.

(1) Objective difficulties

The one inherent difficulty in distinguishing these species is that such characters as the size, shape and indumentum of the leaves as well as the colour and indumentum of the involucre bracts and sometimes also of calyces vary a great deal at different stages of their growth and depend to a certain extent also on the ecological factors of the branches on which these organs grew. Probably it was on account of the descriptions based on such characters that Bentham and Hooker (in *Genera Plantarum* II, 2, 1876 p. 1,159) reduced the 3 or 4 species then admitted by botanists to two only, obviously those originally described by Roxburgh. Previously Schauer (1847) had reduced these two species as two varieties of the same species, *C. tomentosa* Roxb., but Wight (*Icon.* 1849, tt. 1479/1-3) admitted at least three species, leaving out *C. villosa* (Roxb.) of which he could not obtain an authentic specimen. Subsequently Clarke (in Hook. f., *Fl. Br. Ind.* IV, 1885 pp. 602-604) tried to identify these species but again failed to clarify *C. villosa* (Roxb.), retaining this name as printed in Wight's *Icon.* t. 1479/1-B and indicated by him in the text and erratum to be a misprint for *C. velutina* Wight, a species based on two distinct syntypes considered to be identical. However, Clarke included under it also a reference to the unpublished icon of *Roscoea villosa* Roxb. and showed some difference between Wight's and Roxburgh's pictures.

(2) Types and Geography not considered

Another difficulty in understanding Roxburgh's two species may be considered here in its varied aspects.

(a) Firstly, Roxburgh followed the old practice which attached importance to the descriptions more as taxonomic concepts than as taxa interpreted on nomenclatural types. Hence, though he made coloured drawings of his plants, he did not pay much attention to preserving his holotypes, nor to distributing the duplicates. Often he gave away his holotypes to different botanists or institutions, sometimes without any particulars and dates so that it is extremely difficult now to locate the types even though a search was made in Calcutta, Edinburgh, British Museum, Brussels and Geneva.

(b) Secondly, Roxburgh cultivated these two species in the Botanic Gardens, Calcutta, raised probably from seeds or cuttings obtained from the plants that supplied the holotypes, so that these plants were as good as the types (cf. clonotype or spermatype in Furtado in *Gard. Bull. Str. Settl.* IX, 1937, p. 304). Both these species are found listed in Roxburgh's *Hortus Bengalensis* (1814), yet neither Wallich who succeeded Roxburgh in Calcutta, nor any other botanist tried to locate Roxburgh's plants and obtained from them specimens for herbaria.

(c) On the contrary many specimens collected from the plants grown in the Calcutta Gardens are found named and distributed as *Congea azurea* Wall. Surely there must be among these some specimens from the plant or plants Roxburgh had planted.

(3) Early Interpretations

Since Roxburgh's holotypes are not available for consultation, one would have expected some attempts made to typify Roxburgh's species by utilising particulars given by him in his descriptions and plates, and by using any subsequent specimens collected from the type localities and also in the Calcutta Gardens. But unfortunately no such attempts were made even by those who were in a position to do so.

Thus, Wallich who succeeded Roxburgh as the director of the Calcutta Gardens and later had also access to Roxburgh's drawings and descriptions even unpublished ones, named *Congea azurea* Wall. ms. in Cat. (1828) No. 1733 in a manner that reveals the lack of consideration of Roxburgh's types and species. He named *C. azurea* Wall. ms. the specimen No. 1733 (1) or (a) collected in Martaban in 1827, and *C. azurea* var. *latifolia* Wall. ms. the specimen No. 1733 (2) or (b) collected by him at Prome in 1826 with a note that the latter might be a new species or any one of the two species of Roxburgh. Since *R. villosa* Roxb. was yet unpublished, Wallich, by listing it with a doubt under his var. *latifolia*, showed that he was acquainted with Roxburgh's species drawn and described in the manuscript. Besides he was working his catalogue in Kew where Roxburgh's drawings were available for consultation.

Walpers (1844), who probably saw Roxburgh's published plate of *Congea tomentosa* Roxb., but not the holotype from Chittagong (for he gives the Coromandel Coast as its native habitat), described *C. azurea* Wall. ms. 1733 (a) as a species distinct from *C. tomentosa* Roxb., and, contrary to the then common procedures, relegated *Roscoea villosa* Roxb. to its synonymy, either because no specimen or plate of Roxburgh's species was available to him or because he had examined only the specimens of the plants Roxburgh had planted in the Calcutta Gardens.

Schauer (1847), who had seen specimens of Wallich's two forms of *C. azurea* Wall. Cat. 1733 (a) & (b), but none of Roxburgh's types, reduced both Wallich's forms as two varieties of *C. tomentosa* Roxb. of which he had seen a published plate. He made *Roscoea villosa* Roxb. and *C. azurea* Wall. synonyms of *C. tomentosa* var. *oblongifolia*.

Wight (1849) expressed surprise at Walpers' unusual step in reducing the older binomial *R. villosa* Roxb. to *C. azurea* Wall. ex Walpers (1844); but since he did not know Roxburgh's species from any authentic specimens and had seen no plate of *R. villosa*, he excluded the latter from the synonymy of *C. azurea* Wall. and gave a new description together with a pen line drawing of a

specimen of *C. azurea*, obtained from the Botanic Gardens, Calcutta, which may have been from type progeny of Roxburgh's species. Since he regarded *C. tomentosa* Roxb. as native of the Coromandel, he redescribed this species somewhat hesitatingly from Griffith's specimen from Mergui, (probably the isotype of Griffith's posthumous species, *C. vestita* Griff., 1854); however, he admitted the possibility that it might not be the true *C. tomentosa* Roxb. Obviously Wight was unaware that Roxburgh had planted representatives of his type species in the Botanic Gardens, Calcutta, though these were listed in Roxburgh's *Hortus Bengalensis* published in 1814. Otherwise he would have probably made an attempt to get specimens from these authentic plants and tried to see how these differed from *C. azurea* Wall.

The next important botanist to deal with this genus was Clarke who revised it for Hook. f., *Fl. Br. Ind.* IV (1885) 602-604. Though he had co-operation of all the British institutions and herbaria in Great Britain and India, it is indeed surprising that he made no attempt to typify Roxburgh's species by utilising Roxburgh's descriptions and plates, the specimens from the plants Roxburgh had planted in the Calcutta Gardens and the specimens from the type localities. On the contrary he reduced *C. azurea* Wall. 1733-2 or (b) to *Sphenodesme pentandra* Jack, apparently without any justification; for, from Schauer who had seen both specimens of Wallich, and who knew well the genus *Sphenodesme*, one gets the impression that there was hardly any external difference between these two except in the size and shape of the leaves (a very variable factor) and the size of the involucre bracts and calyces (often a matter of development).

Clarke employed *C. azurea* Wall. 1733-1 or (a) as a basionym of *C. tomentosa* var. *azurea* (Wall.) Clarke, creating thereby a superfluous name for *C. tomentosa* var. *oblongifolia* Schauer (1847). While Schauer stated that this variety differed in the leaves, involucre bracts and calyces being smaller than those in the type form which according to Schauer included Wall. Cat. 1733 (b), Clarke reserved this varietal name for the specimens having larger dimensions to these organs. As said above, these parts vary a great deal in size and I have found at least one duplicate of Wall. Cat. 1733 (a) in Herb. Edinburgh having these members of both sizes, since a young flowering twig and a well developed one are mounted on the same sheet. Actually the very large involucre bracts and calyces are a result of post-anthesisal development and are not a varietal character.

Clarke also included Wight's *lc.* 1479/2 and its description under *C. tomentosa* Roxb. proper without realizing that Wight's *C. tomentosa* is identical with *C. vestita* Griff. Further, Clarke retained *C. villosa* (Roxb.) Wight, *lc.* 1479/1-B, a misprint for *C. velutina* Wight, as a combination validly published by Wight, and so he cited under it Roxburgh's *Roscoea villosa* and its unpublished plate. In the text Clarke explained the discrepancies

between the two figures, overlooking the fact that Wight had also considered that it is a 4-bracteate variation of his 3-bracteate *C. velutina* in Wight *l.c.* 1479/3.

Hence, though Wight and Clarke had contributed much to our understanding of the genus and the species, the fundamental difficulties were not clarified so that the subsequent revisions reveal the influence of these two botanists and obscure the status and the specific identities of *C. tomentosa* and *C. villosa* (Roxb.) and some allied species.

Typification of Roxburgh's Species

Roxburgh's types have not been available to me in the present study nor their plates but since the confusion over Roxburgh's two species renders the nomenclature of some other taxa also uncertain, an attempt has been made here to typify the two.

1. *Congea tomentosa* Roxb. (1819) is described as having three involucre bracts which are downy, **pink** coloured, elliptic, sometimes emarginate, over an inch long and $\frac{1}{2}$ inch wide. Corolla tube as long as the calyx. Young shoots tomentose (white ?, not brown which is the colour given to the next species). Native habitat, Chittagong.

Now all the specimens collected from Chittagong agree with these characters, though they have been named invariably as *C. azurea* or *C. tomentosa* var. *azurea*. In fact there is only one species that occurs in Assam and East Pakistan as far north as the Khasya Mountains, and it should be named *C. tomentosa* Roxb. Hence both on plant geographical grounds and description this must be taken as the type form of *Congea tomentosa* Roxb. Specimens numbered Wall. Cat. 1733 (a) or (1) in Herb. Edinburgh are also identical with this. I have not seen Wall. Cat. 1733 (b) or (2), which was from Prome; but specimens collected by others from Prome are identical with these. Many collections made in the Botanic Gardens, Calcutta, and named as *C. azurea* also belong here. Some of these may have come from Roxburgh's plants listed as *Roscoea tomentosa* in *Hortus Bengalensis* (1814) (see "Progeny of types" below).

2. *Roscoea villosa* Roxb. (1832) was described as a species with three involucre bracts to each flower head. The bracts themselves are described as oblong, sessile, spreading, often emarginate or retuse, hairy at the upper base like the calyx; flowers white; calyx clothed both sides with soft white hairs; corolla longer than the calyx; young shoots clothed densely with light brown, soft, short pubescence.

Native in "Pegu in the vicinity of Rangoon" where it is "common in hedges".

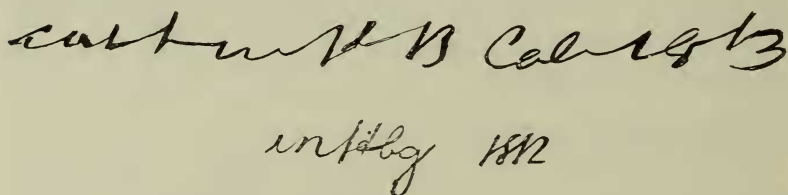
Now the only species that agrees with all these characters is *C. tomentosa* Roxb. which, in young stages, often has, as described by Roxburgh, light brown, soft, short pubescence on young twigs.

Further, many collections made from 1855 onwards in Rangoon, Pegu and in their vicinities all represent one species only, namely *C. tomentosa*. And since F. Carey who supplied the type specimen of *R. villosa*, had found the plant "common in the hedges" in "Pegu in the vicinity of Rangoon", surely such a common plant should have been found at least by one of the many collectors who explored the area botanically. In fact no other species of *Congea* seems to occur so far north in the lower Burma except *C. vestita* Griff. which, though not found in the Rangoon and the Pegu districts, occurs eastwards in the same latitude together with *C. tomentosa* in the Moulmein and the Amherst districts. But Roxburgh described shoots as clothed with light brown soft, short pubescence, a character found in the young shoots of *C. tomentosa*, while *C. vestita* has long brown (hirsute) hairs even on older twigs. Involucral bracts are somewhat oblong and white in young inflorescences, whereas they are always white and broadly ovate-oblong or elliptic-obovate in *C. vestita*. But in this species the corolla tube is shorter than the calyx, while in *C. tomentosa* it is longer as described for *R. villosa* by Roxburgh, though occasionally the corolla tube remains equal to the calyx, as mentioned in the protolog of *C. tomentosa*. Besides, according to the information supplied by Kew, Roxburgh's coloured plate of *R. villosa* shows involucral bracts which are green at the base, pale yellow-green half-way up, becoming pinkish brown towards the apex—a description wholly applicable to the bracts of *C. tomentosa*. In short, *R. villosa* seems to be no more than a variation of *C. tomentosa* which usually produces bifid stigmata described for *R. villosa*, but occasionally also indistinctly bifid ones which could be mistaken for entire as mentioned in the protolog of *C. tomentosa*.

Probable progeny of the type plants.

A further support to this conclusion is found on the identity of the specimens of the plants cultivated in the Botanic Gardens, Calcutta, and distributed to several herbaria in the world under the name *C. azurea*. Since Roxburgh recorded in his *Hortus Bengalensis* (1814), that he had both *R. villosa* and *R. tomentosa* growing in the Gardens, it is surprising that all the specimens represent only one species, *C. tomentosa*. Obviously due to the influence of Wallich, all these specimens have been named *C. azurea*. Unfortunately they do not bear the date of collection, but one specimen in herbarium of Arnold Arboretum obtained from Paris Herbarium bears the following information in faint ink: "Cult. in H.B. Cal. 1813". Since this specimen was made when Roxburgh was still in Calcutta and Wallich had not collected or named in manuscript any species of *Congea*, it is of great nomenclatural value and may be a spermatype or clonotype of *R. villosa* or *C. tomentosa*.

In this connection one may note the following particulars found on two *Congea* specimens made from the plants grown in the Botanic Gardens, Calcutta, and incorporated in Wight's Herbarium, but later distributed "Ex Herb. Wight Propr." to the Calcutta Herbarium and Gray Herbarium (Harvard). The information in the distribution labels of both these specimens is written by the same hand. In the Calcutta specimen it reads "Laid in Aug. 1882", while in the other specimen it reads "Lait in Aug. 1882". Since this was a puzzle to me, I submitted my difficulty to Dr. Furtado who stated that the first error to be noticed is "1882," since Wight was already dead ten years earlier (in 1872). Then "Laid" or "Lait" made no sense, but the specimen from the Botanic Gardens, Calcutta, collected in 1813 and now preserved in the herbarium of Arnold Arboretum, furnished a clue to the solution since the word "cult" in that specimen can be easily misread as "Lait". Hence Furtado suspects that the specimens in Wight's Herbarium must have been collected also when Roxburgh was still in Calcutta and that original label written probably in the same hand as the specimen of 1813. If the entire information were written in a continuous handwriting as in the specimen of 1813, so that a word that follows is joined to one that precedes, "1812" written in that fashion could easily be misread for "1882". However "HBC" could not easily be mistaken



cult in H B Cal 1813
in Hbg 1812

for "Aug.". Perhaps Roxburgh who was preparing his *Hortus Bengalensis*, published in 1814, also wrote on the specimens as "cult in Hbg in 1812", meaning "cult in Horto bengalense in 1812". This would account for "Lait in Aug. in 1882". Furtado suggests that an inquiry be made by consulting Roxburgh's specimens in Paris since the specimens of these are not found in Brussels and Geneva. Wight's specimens together with the other specimen collected in 1813, may represent the two species that were grown in the Gardens.

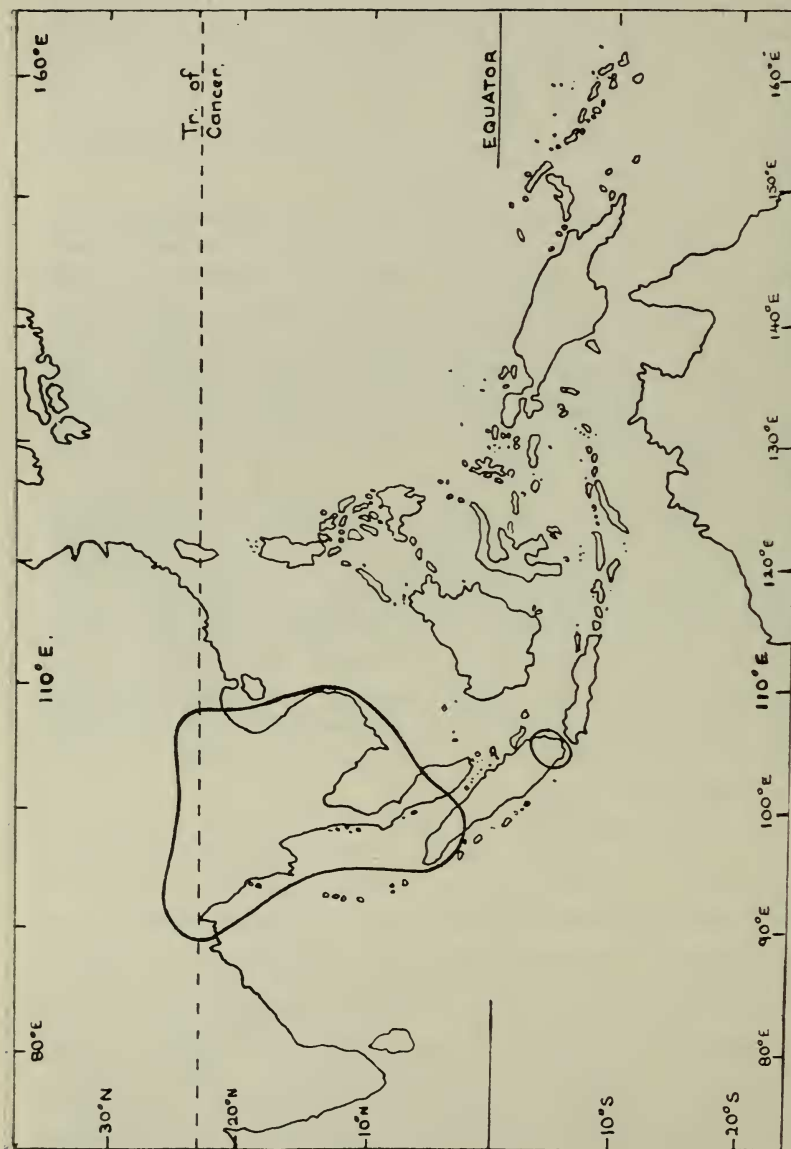
This ingenious explanation by Furtado seems to be very plausible and merits a further inquiry. Since Wight based his drawings and descriptions of *C. azurea* from a specimen obtained from the Calcutta Gardens, this collection of "1812" may be that specimen.

But whatever may be the basis of Schauer's judgement, it is obvious from the circumstantial evidence brought forward in this study that *R. villosa* Roxb. is merely an ecological form of *C. tomentosa* and that Schauer was right in reducing the two of Roxburgh's species to one, though wrong in establishing the varieties. Further since the specimen collected in the Botanic Gardens, Calcutta, in 1813, was distributed to Arnold Arboretum from Paris where Schauer had worked his revision, it seems likely that Schauer who had examined Wallich's 1733 (a) & (b), was able to see also the specimens of the progeny of Roxburgh's types from the Calcutta Gardens. An inquiry in the Paris herbarium might be profitable in this connection.

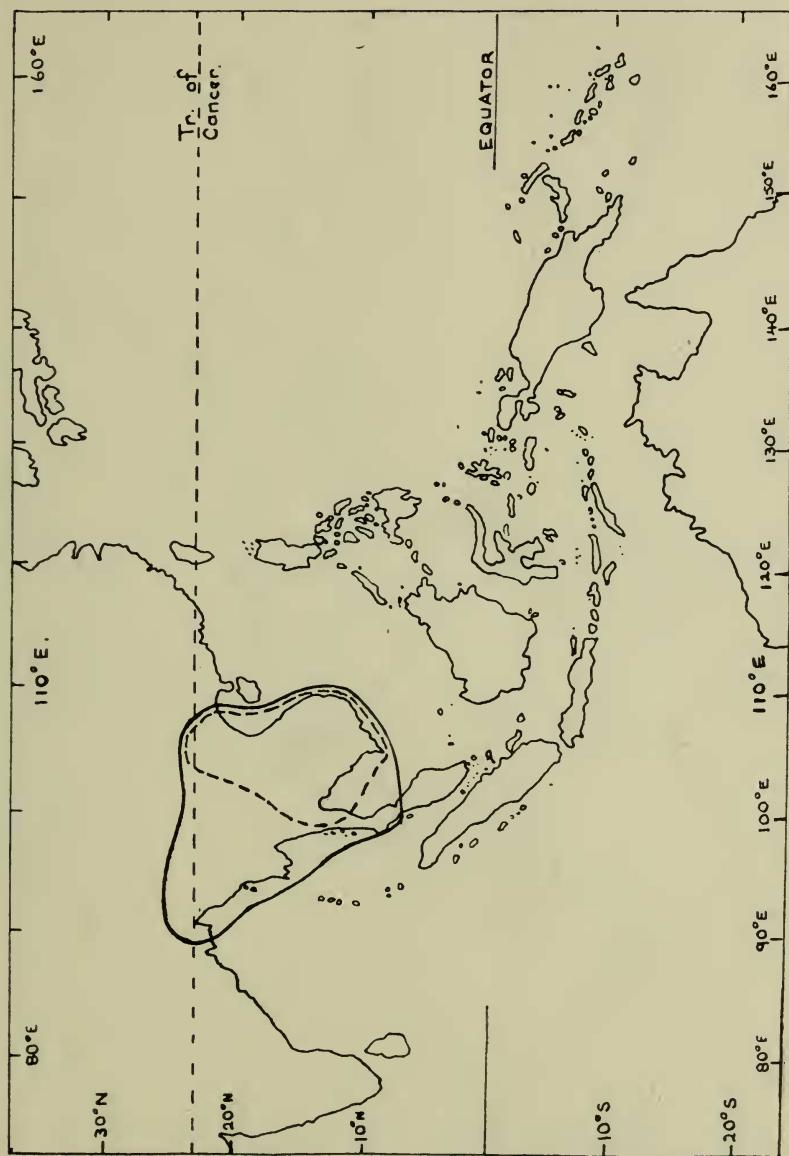
It is obvious therefore that a good deal of confusion that has arisen regarding the identity of these two species has been caused precisely because botanists have ignored the facts that the specimens from two of Roxburgh's species grown in the Calcutta Gardens and those from the type localities of the species, represented only one species; and also because they have tried to give a definite nomenclatural value to *C. azurea* Wall. which is taxonomically superfluous even if the different amendments were nomenclaturally admissible.

DISTRIBUTION: The genus is restricted in its distribution between 90°–109° East longitude and 0°–28° North latitude. In fact the entire genus is confined to what may be called the Indo-Malayan and the Indo-Chinese regions, extending from the Khasya Mountains southwards through Burma, Thailand, Malaya and Sumatra; and eastwards up to Vietnam and Yunnan province of China. So far, it has not been recorded wild from the southern part of the Malay Peninsula, Borneo and Java; and it is wholly absent from West Bengal and peninsular India except as a cultivated plant (See Map 1).

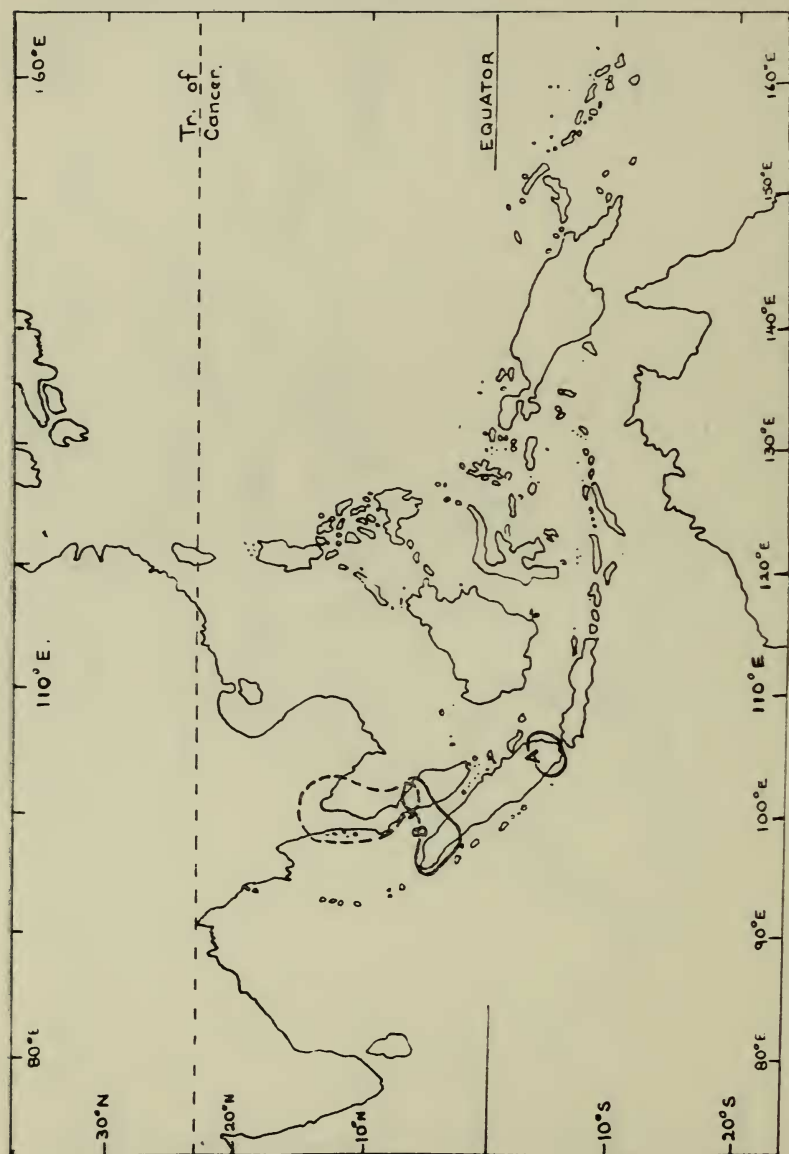
Of all the species of this genus *C. tomentosa* is the most widely distributed species extending from the Khasya Mountains southwards to Thailand and its varietal form (var. *nivea*) from Thailand to Vietnam (See Map 2). *C. forbesii* is the only one that occurs in Sumatra alone and its variety var. *ridleyana* in north Malaya. *C. griffithiana* extends from Mergui to Kedah (in the northern part of the Malay Peninsula) (See Map 3). *C. vestita* is recorded from Martaban and Mergui archipelago in Burma and its var. *subvestita* in South Vietnam. Its allied species *C. pedicellata* is found in Laos and Vietnam (See Map 4). *C. siamensis* and *C. velutina*, two very close allies, are found in the Tenasserim district of Burma and Lower Thailand. *C. chinensis* is found in Yunnan province of China and on the borders of Upper Burma, and its variety *latibracteata* is in the Mandalay district of Burma (See Map 5). *C. connata* and *C. rockii* are endemic in Thailand (See Map 6).



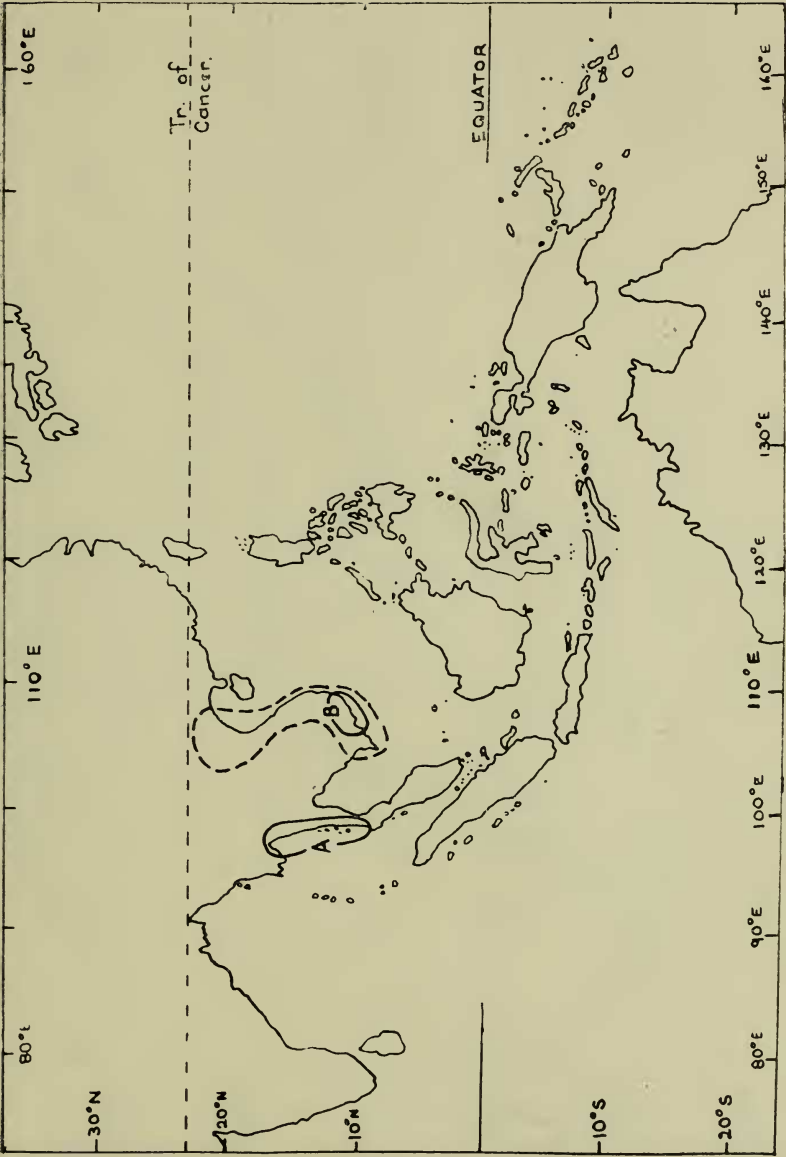
Map I. Distribution of genus *Congea* Roxb (——)



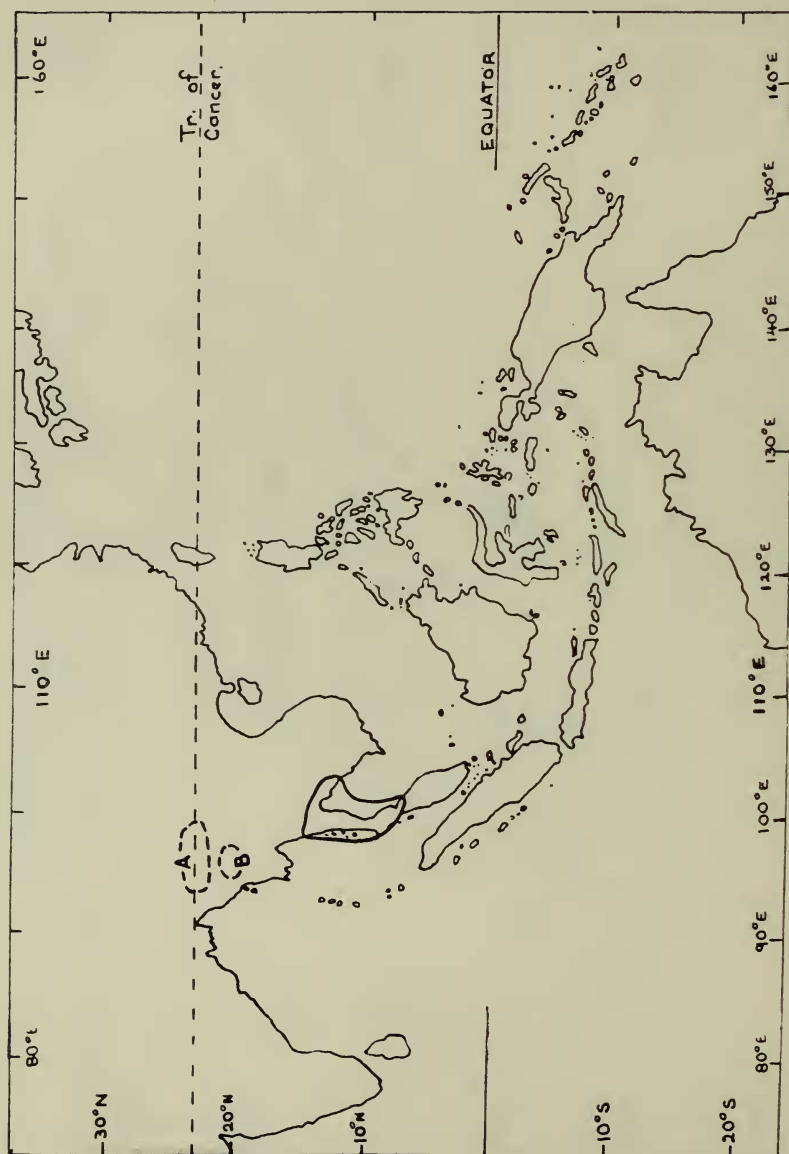
Map 2. Distribution of *C. tomentosa* var. *tomentosa* (——);
C. tomentosa var. *nivea* (-----).



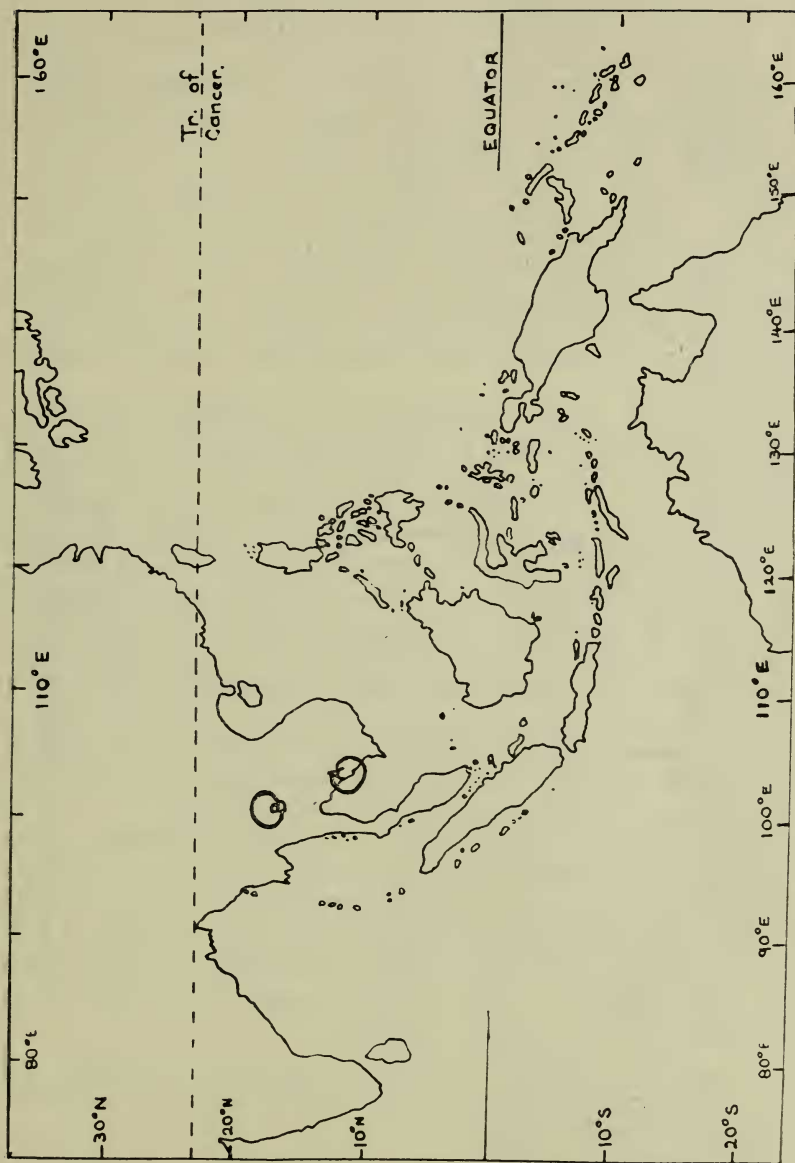
Map 3. Distribution of *C. forbesii* var. *forbesii* (— A —); *C. forbesii* var. *ridleyana* (--- B ---); *C. griffithiana* (.....).



Map 4. Distribution of *C. vestita* var. *vestita* (—A—); *C. vestita* var. *subvestita* (—B—); *C. pedicellata* (-----).



Map 5. Distribution of *C. velutina* & *C. siamensis* (—);
C. chinensis var. *chinensis* (----A----); *C. chinensis* var.
latibracteata (----B----).



Map 6. Distribution of *C. connata* (—— A ——); *C. rockii* (—— B ——).

SUMMARY

In this revision of the genus *Congea*, attempts have been made to solve certain problems which, though contributing to a great confusion on the identity of some species, had been neglected in the past. Thus it is shown here that the holotype of *C. tomentosa*, the type species of the genus, was from Chittagong as stated in the protolog and that the additional statement that the species is indigenous in Coromandel, found in the subsequent reprint of the description, was an addition caused by a misplacement of an isolated printed line belonging to another taxon described in the second work. In fact it is shown that no species of *Congea* is found wild in any part of peninsular India. These facts have helped to identify precisely *C. tomentosa* which is the only one that occurs indigenous in the vast region around Chittagong. Hence what invariably passes as *C. tomentosa* var. *oblongifolia* or *C. tomentosa* var. *azurea* has to be called *C. tomentosa* var. *tomentosa* on the basis of both plant-geography and the original description.

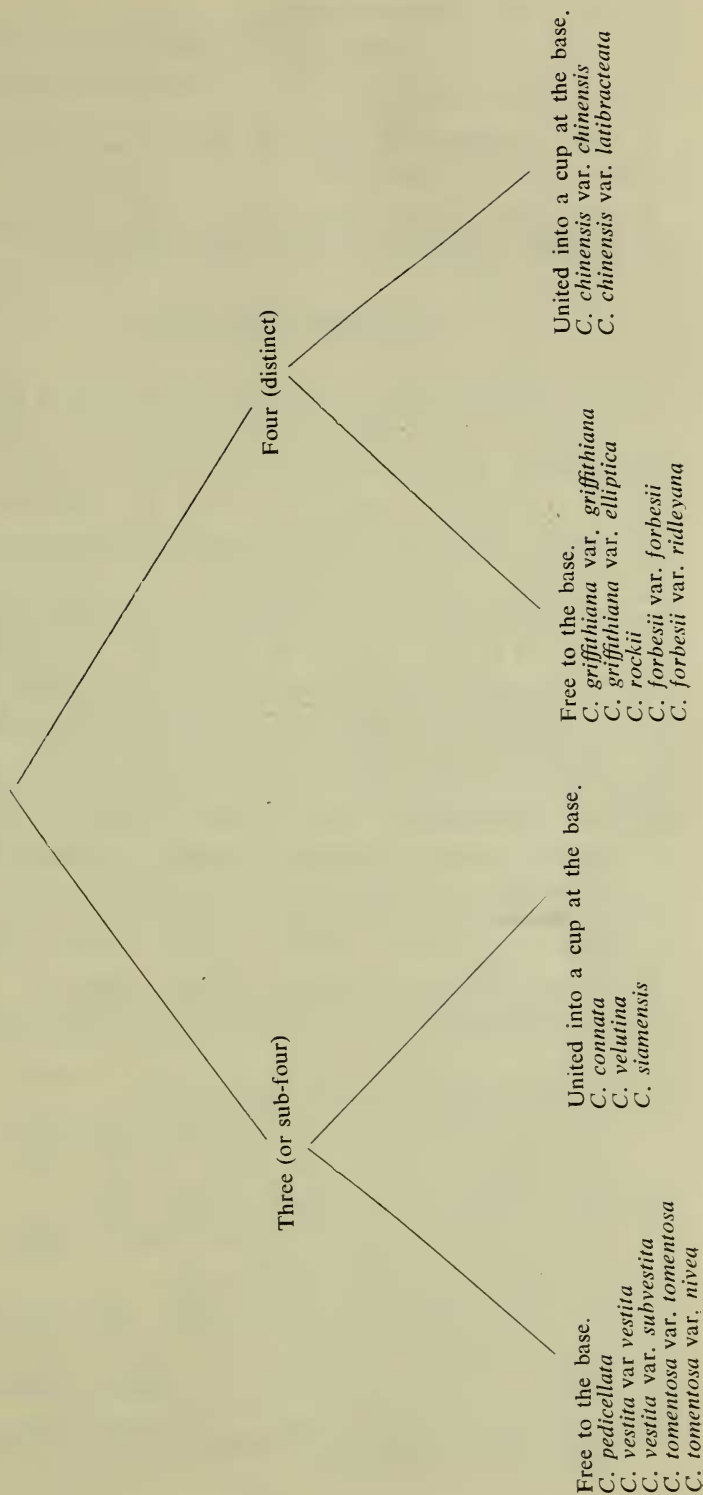
This species extends southwards to the burmese districts of Pegu and Rangoon, where no other species has ever been found wild. This fact and Roxburgh's description have been used to show that *C. villosa* (Roxb.) Clarke (based on the holotype collected in Pegu near Rangoon) is merely an ecological form of *C. tomentosa* var. *tomentosa*. Confirmatory evidence on the identity of these two Roxburgh's taxa is drawn from the many herbarium specimens of the plants in the Botanic Gardens, Calcutta, where Roxburgh had grown progeny obtained from the two type plants; these specimens are distributed under the name of *C. azurea*, the basionym of *C. tomentosa* var. *azurea*, but all represent *C. tomentosa* var. *tomentosa*. Though I was not able to see any type, photographs of their coloured plates made under the direction of Roxburgh confirm the accuracy of my deductions.

By utilizing the characters like the number of bracts to an involucre, the extent of the union of the bracts at the base, presence or absence of a conspicuous pedicel to the calyx, and the length of the corolla tube in relation to the length of calyx, it has been possible to remove the confusion or indefiniteness that existed over the identity or limits of some species. The results thus obtained may be condensed as follows:

1. Species or varieties reduced to synonymy: *C. oblonga*, *C. peteloti*, *C. tomentosa* var. *azurea*, *C. tomentosa* var. *oblongifolia* and *C. villosa*.
2. Taxonomic limits redefined: *C. forbesii*, *C. tomentosa*, *C. velutina* and *C. vestita*.
3. Redescribed from the holotype: *C. rockii* (it bears 4 bracts to an involucre and 5-6 flowers to a cyme, not 3 bracts and 3 flowers as stated in the protolog).

Grouping of *Congea* species and varieties on the basis of

Involucral Bracts



4. New taxa established here: *C. chinensis* var. *latibracteata*, *C. forbesii* var. *ridleyana*, *C. griffithiana*, *C. pedicellata*, *C. tomentosa* var. *nivea*, *C. velutina* var. *elliptica* and *C. vestita* var. *subvestita*.
5. The remaining three species not confused so far: *C. chinensis*, *C. connata* and *C. siamensis*.

In short this genus as revised here consists of ten species and five varieties, two species and all varieties being new.

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Congea

Congea Roxb., Pl. Corom. III (1819) 90, t. 293; Endlicher, Gen. Pl. (1836) 638, No. 3715 p.p.; Meissner, Gen. Pl. Vascul. I (1836) 292 & II Comment. (1843) 200 p.p.; Walp., Repert. Bot. IV (1844) 116 p.p.; Schauer in DC., Prodr. XI (1847) 623; Wight, Ic. Ind. Or. IV, part 3 (1849) 14; Miquel, Fl. Ind. Bat. II (1858) 911; Benth. & Hook., Gen. Pl. II, Part 2 (1876) 1159; Kurz, For. Fl. Burm. II (1877) 256; Clarke in Hook. f., Fl. Br. Ind. IV (1885) 602; Briq. in Engl. U Prantl, Pflanzenfam. IV, 3a (1897) 181; King & Gamble in Journ. As. Soc. Beng. LXXIV, II (1908) 864; Lam, Malay. Verb. (1919) 336; Bakh. in Bull. Jard. Bot. Buitenz. III (1921) 100; Ridl., Fl. Mal. Pen. II (1923) 640; Dop in Fl. Gén. Indoch. IV (1936) 908.

Roscoea Roxb. Fl. Ind. III (1832) 54 pro parte, (altera parte *Sphenodesme*).

Calochlamys Presl, Bot. Bemerck. (1844) 148; Walp., Repert. Bot. VI (1846) 691.

TYPE SPECIES: *C. tomentosa* Roxb. from Chittagong (not Coromandel).

Large climbing shrubs; branches almost cylindric, usually tomentose with mixed simple and stellate hairs. *Leaves* simple, opposite, entire, reticulate unicostate. *Inflorescence* in axillary and terminal panicles. *Cymes* capitate, pedunculate, 3–9 flowered; involucre bracts 3 or 4 free or united at base, violet or white tomentose, elliptic or oblong or spatulate. *Flowers* often sessile, sometimes long pedicelliform or pedicellate (i.e. *C. vestita* and *C. pedicellata*); *calyx* tubular or infundibuliform, 5-toothed, slightly accrescent. *Corolla* bilabiate, oblique; tube cylindric, glabrous except a villous band in throat; upper lip erect, 2-lobed, the lower of 3-lobes. *Stamens* 4, exserted, didynamous, epipetalous, inserted in the throat of the corolla; anthers almost orbicular. *Ovary* obovoid, glabrous, glandular at apex, imperfectly 2-celled, each cell 2-ovuled; style as long as the stamens or more, filiform; stigma shortly bifid. *Drupe* obovoid, nearly dry, 1-seeded.

DISTRIBUTION: Assam in India, East Pakistan, Burma, Thailand, Malaya, Sumatra, Cambodia, Laos, Vietnam and South-western China.

This genus together with the allied genera are regarded to form a distinct group, the systematic status of which is not yet clearly defined. Some botanists have considered the group as a tribe or subtribe (Symporemeae) of Verbenaceae, others as its subfamily (Symphoremoidae) or even as a distinct family (Symphoremaceae). I hope to get some details on this after studying the genus *Symphorema*.

9. (a) Involucral bracts 3, narrowly elliptic-oblong, albo-canescens above; cup $\pm$ 6 mm. long. (Calyx teeth almost $\frac{1}{4}$ th or less of the tube)
C. connata
- (b) Involucral bracts 3, occasionally sub-4, spathulate or elliptic-obovate, violet, tomentose above; cup 3-4 mm. long 10.
10. (a) Leaves elliptic, cuneate towards base; involucral bracts always 3, spathulate to oblanceolate; cup $\pm$ 3 mm. long. (Calyx teeth almost $\frac{1}{4}$ th of the tube) C. velutina
- (b) Leaves elliptic to ovate, cordulate at base; involucral bracts usually 3, occasionally sub-4, oblong-elliptic to obovate; cup $\pm$ 4 mm. long. (Calyx teeth almost one-third the length of its tube)
C. siamensis
11. (a) Flowers sessile; involucral bracts elliptic-oblong or elliptic-obovate, violet or white tomentose; corolla tube longer than the calyx ... 14.
- (b) Flowers pedicellate; involucral bracts broadly elliptic or obovate, light cream coloured or greyish-white; corolla tube shorter than the calyx 12.
12. (a) Branchlets and inflorescence axis cinereo-pubescent; leaves elliptic, usually rounded at base, rarely cordulate, chartaceous, scabridulous above, grey-pubescent beneath; involucral bracts elliptic to obovate, greyish-white; flower pedicel very long; calyx sericeo-pubescent without C. pedicellata sp. nov.
- (b) Branchlets and inflorescence axis ferruginous hirsute, or faintly yellowish pubescent; leaves ovate or elliptic, cordulate at base, coriaceous, scabrid above, fulvidous-hirsute or faintly yellowish pubescent beneath; involucral bracts most broadly elliptic (2-4 by 1-2 cm.), light cream coloured, flower pedicel shorter; calyx hirsute outside 13.
13. (a) Branchlets, inflorescence axis and underside of leaves ferruginous to fulvous-hirsute C. vestita var. vestita
- (b) Branchlets, inflorescence axis and underside of leaves faintly yellowish-pubescent C. vestita var. subvestita var. nov.
14. (a) Branchlets and inflorescence axis tomentose, flavescent when young, later canescent; involucral bracts elliptic to oblong, violet, tomentose, provided at the base above with long and thick canescent hairs; calyx densely sericeo-hirsute without; lobes (at anthesis) almost half the length of calyx tube, pointed, each usually provided at the tip with a linear accessory tooth; corolla with a narrow, almost fugacious villous band in throat.
C. tomentosa var. tomentosa
- (b) Branchlets and inflorescence axis cinereo-tomentose; involucral bracts ovate or broadly elliptic, white tomentose; calyx cinereo-pubescent without, lobes almost one-third the length of calyx tube or shorter without any accessory teeth; corolla with a broad villous band in throat C. tomentosa var. nivea var. nov.

DESCRIPTION OF SPECIES

1. *Congea chinensis* Mold., Phytologia II (1947) 311 & Résumé Geogr. distr. & Syn. (1959) 169. var. *chinensis* — Fig 1.

Among all the species with four involucre bracts, *C. chinensis* is easily distinguished by its involucre bracts being united into a cup (up to 6 mm. long) at the base.

Branchlets cylindric, cinereo-tomentose. *Leaves* chartaceous, narrowly elliptic, acuminate towards apex, almost rounded or cordulate at base, excepting the puberulous midrib glabrous above, pubescent below, up to 14.5 cm. long, 6 cm. broad; main lateral nerves 5–6 pairs, more conspicuous and more densely hairy beneath; intramarginal nerve prominent on the underside; petiole up to 7 mm. long, densely hairy. *Inflorescence* in axillary and terminal panicles, 15–25 cm. long, canescent. *Cymes* 5-flowered; involucre bracts 4, united into a cup at the base, oblong-oblanco-late, narrowed towards the base, uniformly hoary in the upper surface, often sericeous along midrib above, 2.5–3 cm. long, 5–8 mm. broad; cup $\pm$ 6 mm. long; peduncles 1–1.8 cm. long, canescent. *Calyx* almost campanulate, 5-lobed, albo-sericeous without, appressedly hairy within, up to 7–8 mm. long; lobes acute, almost crisate. *Corolla* exserted, bilabiate; tube cylindric, $\pm$ 7 mm. long, glabrous but with a broad villous band in the throat. *Stamens* 4, much exserted; filaments filiform; anther lobes almost orbicular. *Ovary* obovoid, glabrous, glandular towards apex, $\pm$ 2 mm. long; style filiform.

CHINA: Yunnan (Tsai 25,611: SING, isotype).

BURMA: Kachin Hills, north of Myitkyina on road to Kanpti Long (Toppin s.n.: E, 4,225: CAL); Tankhu, alt. 1,500–2,500 ft. (Kingdon-Ward 20,514: A, BM & E; 9,049: BM).

- 1a. *Congea chinensis* Mold. var. *latibracteata* Munir var. nov. — Fig. 1a.

A forma typica foliis late ellipticis, inflorescentiae axi flavido pubescente, bracteis involucrelibus oblongis, violaceis, tomentosis, basi longe albo pilosis, cupulo involucri brevioris (circa 4 mm. longis), calycibus externe hirsutis (inflorescentiae internodis, bracteis foliariis axillantibus et pedunculis brevioribus) haec varietas facile distinguenda.

This variety is easily distinguished from the type form, in its leaves being broadly elliptic; inflorescence axis flavido-pubescent; involucre bracts oblong, violet, tomentose with long canescent hairs at the base above; cup shorter ($\pm$ 4 mm. long); calyx densely hirsute outside (panicles internodes, peduncle and the axillant bracts smaller).

BURMA: Maymyo, alt. 3,500 ft. (Lace 6,146: E, holotype & isotype).

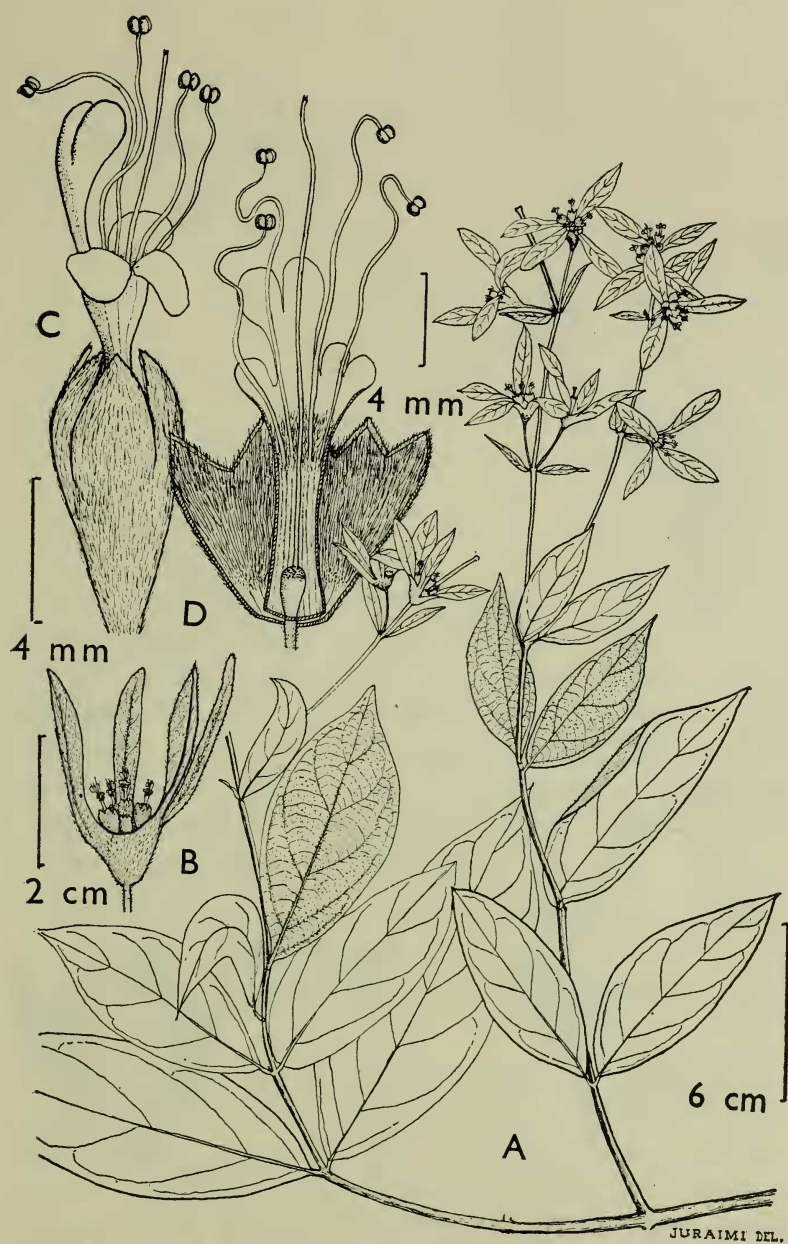


Fig. 1. *Congea chinensis* var. *chinensis* (Tsai 52,611 in SING).

A, Fertile twig. B, Cyme to show involucre cup. C, Flower. D, Flower longitudinally cut open to show its internal structure.

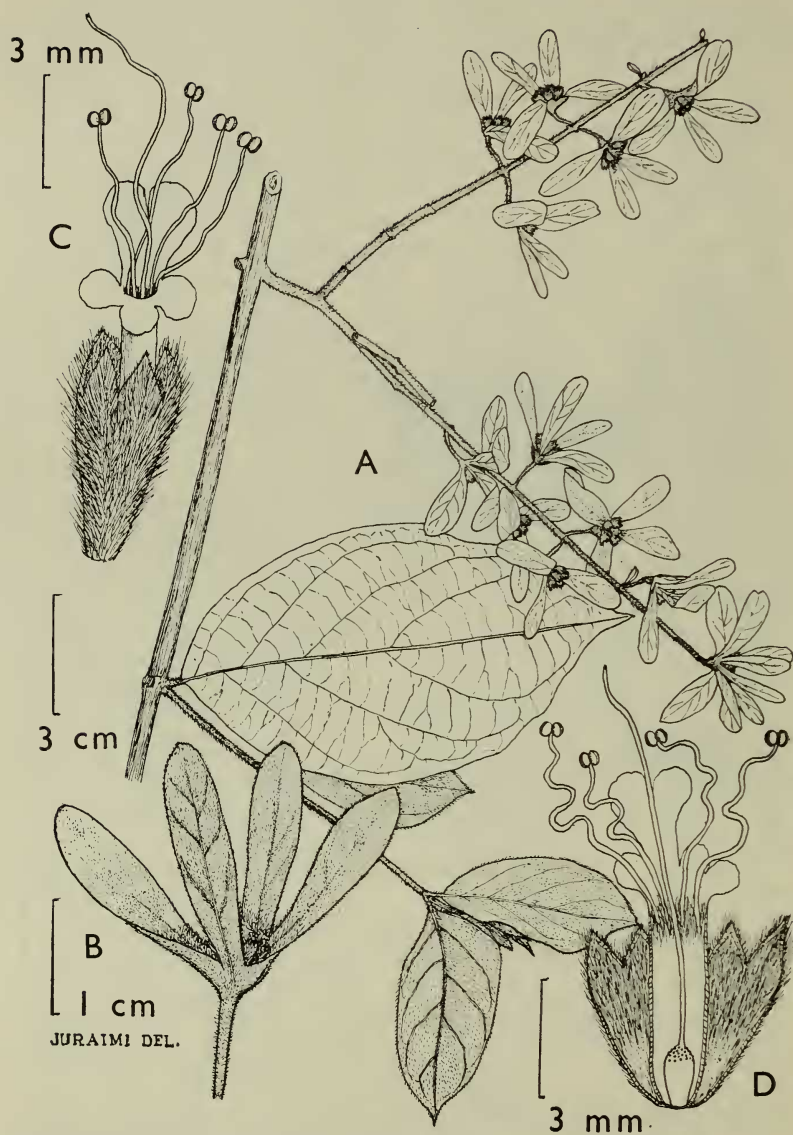


Fig. 1a. *Congea chinensis* var. *latibracteata* (Lace 6,146 in E).

A, Flowering twig. B, Involucre with flowers. C, Flower. D, Flower vertically cut open.

2. *Congea rockii* Mold., in Phytologia VIII (1961) 14 — Fig. 2.

This species is closely allied to *C. forbesii* in having oblong-lanceolate leaves, four involucre bracts free to the base and pedicelliform flowers, but is easily distinguished by its brownish, very long, forward pointing and conspicuous hairs on branchlets and inflorescence; involucre without any additional pair of bracteoles and (young) cymes 5–6 flowered.

Stem slender, almost cylindric, densely fulvous-tomentose, interspersed with long hairs. *Leaves* chartaceous, oblong-lanceolate, acuminate at apex, almost rounded or cordulate at base, nitid and glabrous above, but pilose in margins and puberulous in midrib above, densely fulvous-pubescent beneath, brunnescent when dry, 5.5–12.5 cm. long, 2–3.5 cm. broad; main lateral nerves 5–7; petioles 5–7 mm. long, densely fulvous-hirsute. *Inflorescence* in axillary and terminal panicles, lax, up to 30 cm. long, with long, dense, fulvous tomentum; cymes 5–6 flowered (only young available); involucre bracts 4, free to the base, narrowly elliptic, densely white tomentose above, very densely fulvous hairy beneath, young 10–14 mm. long, $\pm$ 4 mm. broad; peduncles 5 mm. long (young). *Calyx* pedicelliform, campanulate, densely fulvous-tomentose with long porrect and conspicuous hairs without, appressedly hairy within. *Corolla* (undeveloped) bilabiate, glabrous with a villous ring at the throat. *Stamens* 4; filaments short, undeveloped; anthers $\pm$ orbicular. *Ovary* almost obovoid, glabrous, glandular towards apex; stigma and style short.

THAILAND: **Chiangmai**, between Ta Kaw and Meh Soi (Rock 1,677: UC, **holotype**; A, isotype).

Both the specimens studied here are too young, but the species is quite distinct.

In protolog the author described the species as having 3-flowered sessile cymes with only 3 involucre bracts; but even in the holotype specimen the heads (cymes) are actually pedunculate, bearing 5–6 flowers, and their involucre bracts are always 4. However, the inflorescence is young and the peduncle and other parts are not fully developed; and the two opposite cymes becomes so congested in the axils of the foliar bracts that the examination of the cyme is not easy. The long hairs also interfere in the counting of flowers. Hence, unless a cyme is detached it is difficult to make a proper analysis.

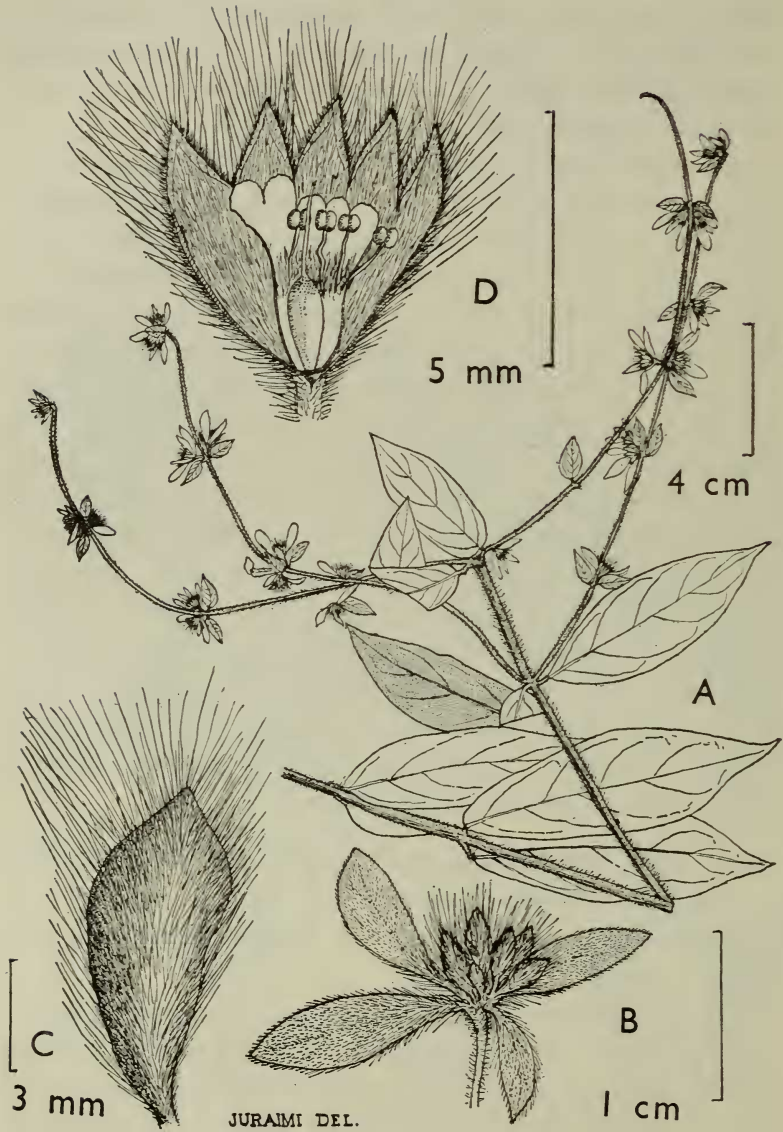


Fig. 2. *Congea rockii* (Rock 1,677 in UC).

A, Twig with immature inflorescence. B, Young cyme to show the number of bracts and flower buds. C, Flower bud. D, Dissected flower bud.

3. *Congea griffithiana* Munir sp. nov. var. *griffithiana* — Fig. 3.

C. velutina Wight, Ic. IV, 3 (1849) 15 quoad t. 1479/B tantum (sphalmate *C. villosa*); Bakh. in Bull. Jard. Bot. Buitenz. III, Ser. 3 (1921) 101 p.p.; Mold., Résumé Geogr. distr. & Syn. (1959) 165, 179 & 275 p.p.

"*C. villosa* (Roxb.) Wight" sec. Clarke in Hook. f., Fl. Br. Ind. IV (1885) 603 p.p.; Briq. in Engl. & Prantl, Pflanzenfam. IV, 3a (1897) 181; Bakh. in Bull. Jard. Bot. Buitenz. III, Ser. 3 (1921) 100 p.p.; Mold., Résumé Geogr. distr. & Syn. (1959) 165, 177, 179 & 275, non *Roscoea villosa* Roxb.

C. villosa Wight sec. Fletcher in Kew Bull. (1938) 440.

C. tomentosa Roxb. sensu King & Gamble in Journ. As. Soc. Beng. LXXIV, II (1908) 866; Hallier in Meded. Rijks' Herb. Leiden 37 (1918) 86 p.p. Ridl., Fl. Mal. Penin. II (1923) 640 p.p.

Haec species involucris 4-bracteatis liberis, bracteis azureis spathulatis basin versus cuneatissimis inter omnes distinctissima.

This remarkable species often confused with *C. velutina* and *C. villosa* (Roxb.) is readily distinguished by its 4 involucre bracts which are quite free to the base and violet in colour and spathulate much narrowed towards the base. The two other species, *C. rockii* and *C. forbesii*, also with 4 bracteate involucres and no cup at the base, have elliptic to oblanceolate and more densely hoary whitish bracts.

Branchlets cylindric, tawny tomentose. *Leaves* sub-coriaceous to chartaceous, elliptic, acuminate at apex, cuneate towards base, glabrous above, fuscous pubescent beneath, up to 12 cm. long, 6 cm. broad; main lateral nerves 4 pairs; petioles 5–10 mm. long, pubescent. *Inflorescence* in axillary and terminal panicles, tawny tomentose in axis; panicles up to 45 cm. long. *Cymes* 5-flowered; involucre bracts 4, free to the base, spathulate to oblanceolate, much narrowed towards base, violet, thickly tomentose above, pubescent below, up to 3 cm. long, 1.3 cm. broad; peduncles almost 1 cm. long, pubescent. *Calyx* campanulate, 5-lobed, 4–5 mm. long, densely canescent hairy without, appressedly hairy within; lobes acute, crispate in margins, almost 1 mm. long. *Corolla* exserted; tube slightly longer than calyx, glabrous with a villous band in the throat; lobes almost rounded. *Stamens* 4, exsert; filaments long, up to 1 cm. long or more; anthers almost orbicular. *Ovary* ± obovoid, glabrous, glandular at apex; style longer than the filaments; stigma indistinctly bilobed.

BURMA: **Lower Burma**, Rangoon, in brushwoods and hedges, (Smith 55: A). [an escape from cultivation?]; Mergui (Griffith, known from Ic. 1479/B and K.d. No. 6012/1: K).

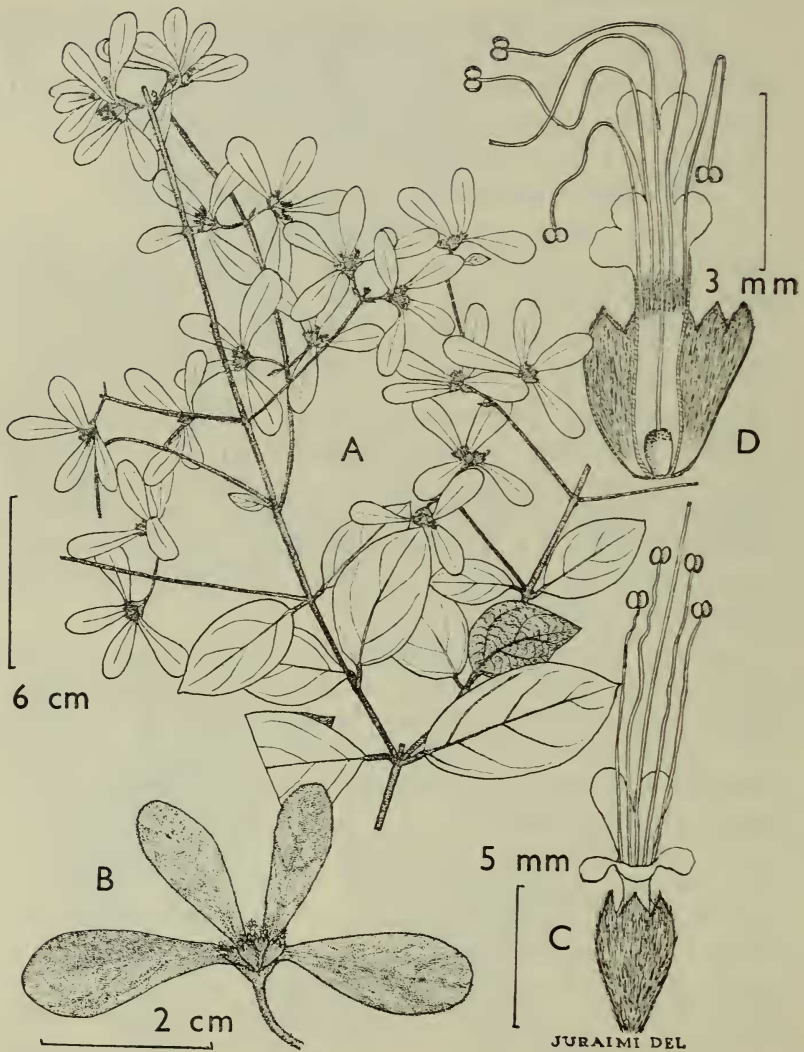


Fig. 3. *Congea griffithiana* var. *griffithiana* (Curtis 2,962 in SING, holotype).

A, Inflorescence. B, Cyme with its bracts and flowers. C, Flower. D, Dissected flower showing the disposition of the internal organs.

THAILAND: **Surat**, Kao Meo in bamboo forest (Kerr 12,470: BM & E). **Puket**, Ranawng, Kaw Banghen, in evergreen forest (Kerr 16,656: BM & E); **Katu** (Kerr 17,466: BM, E & K). **Kopah** (Haniff 3,858: SING). **Nakhon Si Thammarat**, Songkla, **Wang Yai** (Kerr 14,762: BM & E); Kao Ram, near stream (Smith 650: BM & E); Ban Pak Phanang? (Collins s.n.: BM); Chawang (Snan 99 & 913: BKF); Thung Song (Snan s.n.: K). **Poongah**, near the village (Curtis 2,903: CAL; 2962 SING, **holotype**; CAL, isotype).

MALAYA: **Kedah**, Gurun, 33½ mile Jeniang Road (Kadir SFN. 35,802: A, KEP & SING); Ulu Patani Mulik (Sow 34,622: KEP).

CULTIVATED: MALAYA, **Selangor**, Kuala Lumpur public gardens (Jaamat & Kasim 15,225: KEP & SING). **Johore**, Kota Tinggi, Nam Heng (Teruya 544: SING). **Singapore**, Botanic Gardens (Furtado s.n.: SING & UC; Noor s.n.: SING; Hallier 247: L; Munir 3: SING). INDONESIA: **Sumatra**, Sibolangit Garden (Lorzing 11,949: L & SING). **Java**, Batavia, Bogor Gardens (Visser C 90,401: L; Baker 36,411: L; Durand 7,204: L); Plant XV E. 71 (Leg.?: L & NY; Dilmy, L); Plant XV E. 3 XII. B. IX. 53 (Leg.?: NY); Tjidadap Tjibelier ± 1,000 M (Bakhuizen 285: CAL, L, SING). **Borneo**, Bandjermasin (Djimat Tatong 2,000: L). PHILIPPINE: **Luzon**, Laguna Province, at Los Banos (Steiner 22,801 & 22,931: PNH); Mt. Makiling (Canicosa 9,636: PNH; Esben 34,293: PNH; Rivera 33,460: PNH; Sulit 8,313: PNH). **Cebu**, Camp 7, Minglanilla (Cabiluna PNH No. 92,025: PNH). BELGIAN CONGO: loc. incert. (Goossens 4,511: NY).

This species was included as the paratype of *C. velutina* Wight. King & Gamble, however, described this species as *C. tomentosa* Roxb. though they quoted under it Roxburgh's plate (type) and Wight t. 1479/2 (= *C. vestita*). Fletcher's *C. villosa* is entirely this species, though he has regarded it as a new species of Wight.

The specimens collected by Bakhuizen from Preanger in Java (No. 285) and those collected by Djimat Tatong from Bandjermasin in Borneo are apparently from cultivated plants, though the collectors do not state so. The vernacular name in Borneo specimens is stated to be "Rongea" which might be a mis-copying of the name "Kongea". This species is not found wild so far south and on mountains. Similarly Smith 55 from Rangoon may be an escape from a cultivated plant; it has never been collected before so far north, the northernmost region hitherto known is Mergui where Griffith had collected the first specimen of the species which formed the basis of Wight *lc.* t. 1479/B.

Nomenclature

The nomenclature of this species presents certain problems which must be understood before the procedure followed here can be appreciated. Clarke (1885) adopted "*C. villosa* (Roxb.) Wight" as validly published in Wight *Ic. t.* 1479/B (1849) for *R. villosa* Roxb. which he quoted in the synonymy. However, Clarke also noted the difference between the 3-bracteate involucre of *R. villosa* as represented in Roxburgh's unpublished coloured plate in Kew and the 4-bracteate involucre of cymes in Wight's figure. Most of the subsequent botanists have followed Clarke and accepted Wight as the author of the new combination based on *R. villosa* Roxb. But Fletcher (1938), noticing that Wight's plant is specifically different from Roxburgh's, concluded that Wight had not published a new combination but only a new species, *C. villosa* Wight. Hence he excluded from it all reference to Roxburgh or to *R. villosa* Roxb., though he failed to account for Roxburgh's species based on a type from Burma. Moldenke (1959) has apparently accepted both *C. villosa* Wight and *C. villosa* (Roxb.) Wight as validly published binomials, though the former he reduced as the synonym of the latter.

Now, did Wight actually publish any of these binomials? If not, who are their authors? May any of these names be used as the correct one for the present species?

In the first place (*Ic. IV*, 3, 1849, p. 14) in discussing Schauer's monographic revision (1847), expressed doubts on the correctness of reducing *C. villosa* Roxb. (sic) and *C. azurea* Wall. to *C. tomentosa* Roxb., but since he had not seen any authentic specimen of Roxburgh's *villosa*, he left this species out of consideration. In addition he stated under *C. azurea* Wall. that he did not know Roxburgh's species (*villosa*), but questioned the propriety of Walpers in reducing the old *R. villosa* Roxb. as a synonym of the new species, *C. azurea* Wall. ex Walpers (1844), obviously because under the then current procedures Walpers should have made *R. villosa* Roxb. the basionym of the new isonym under *Congea* with *C. azurea* Wall. as a synonym. Besides he argued that had *C. azurea* and *C. villosa* been identical as Walpers maintained, Wallich would not have created a new binomial *C. azurea*. In other words, Wight treated as if Roxburgh himself had created *C. villosa* Roxb. and so he did not refer to *R. villosa* Roxb. at all. But since he was anxious to refrain from expressing any opinion on Roxburgh's *villosa* and left it out of his consideration, this casual reference to Roxburgh's species as *C. villosa* Roxb. and not *R. villosa* Roxb., cannot be taken as the formal publication by Wight of the new combination under *Congea* for *R. villosa* Roxb. and it could never be associated with Wight *Ic. t.* 1479/B.

As stated in my introductory remarks, the other "*C. villosa* (Roxb.)" in the legend of Wight *l.c.* t. 1479/B was a misprint for *C. velutina* Wight and this fact was stated by Wight himself both in the text and "erratum", the latter inserted as a separate line at the end of *C. azurea* Wall.

This means that Wight did not validate *C. villosa* either as a new binomial or as a new combination. However, Clarke, overlooking that "*C. villosa* (Roxb.)" was a misprint for *C. velutina* (Wight), [Wight quoted authors' names in brackets] adopted it as the correct name of a species and cited *R. villosa* Roxb. as its basionym. Therefore, it was Clarke who, unconsciously though it may be, made the combination valid; and so it may be cited as *C. villosa* (Roxb.) Wight ex Clarke. Hence *C. villosa* Wight ex Fletcher (1938), even if regarded as validly published, can be accepted only as a later homonym.

It is obvious, therefore, that, though *C. villosa* (Roxb.) Clarke has been relegated here merely as a synonym of *C. tomentosa* Roxb. and Fletcher intended to restrict the use of "*C. villosa* Wight" entirely to the present species, a new name had to be created for this taxon apparently not adequately described before. This lacuna has now been filled by establishing *C. griffithiana* as a new species.

3a. *Congea griffithiana* Munir var. *elliptica* Munir var. nov. — Fig. 3a.

A former typica bracteis involucris ellipticis apice acutis, pedunculis longioribus crassioribusque haec varietas sat distincta.

This variety can be easily distinguished from the type form, by its involucre bracts being elliptic, acute at apex, and peduncles longer and thicker.

BURMA: Tenasserim, Mergui Island (Proudlock 36: CAL, holotype).

4. *Congea forbesii* King & Gamble in Kew Bull. (1908) 114 & Journ. As. Soc. Beng. LXXIV, II (1908) 866; Lam., Malay. Verb. (1919) 337; Mold., Résumé Geogr. Distr. & Syn. (1959) 188. var. *forbesii* — Fig. 4.

C. velutina sensu Bakh. Bull. Jard. Bot. Buitz. III (1921) 101; Dop in Fl. Gén. Indoch. IV (1936) 908; pro parte.

Among all the species of *Congea* with four involucre bracts free to the base, *C. forbesii* K. & G. is easily distinguished by its (grey-tomentose) narrowly oblong or oblanceolate involucre bracts accompanied by an additional pair of short, linear, setaceous bracteoles.



Fig. 3a. *Congea griffithiana* var. *elliptica* (Proudlock 36 in CAL).
A, Fertile twig. B, cyme to show the shape of its bracts.

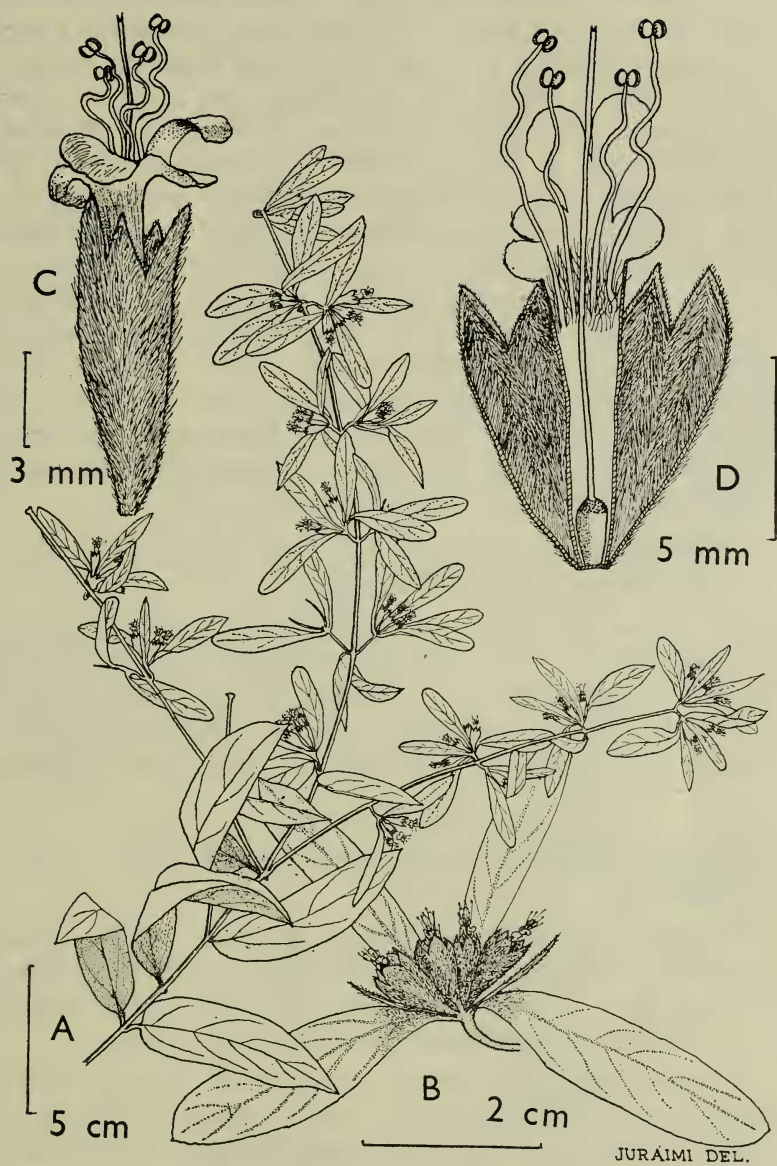


Fig. 4. *Congea forbesii* var. *forbesii* (Forbes 1,567 in SING).

A, Inflorescence. B, Cyme to show the two additional bracteoles. C, Flower. D, Ibid. longitudinally cut open to show the internal organs.

Branchlets slender, hairy tomentose. *Leaves* chartaceous, oblong or oblong-lanceolate, shortly acuminate at apex, rounded or slightly cordulate at base, nitid and excepting the puberulous nerves glabrous above, shortly tawny pubescent below, brownish when dry, 7–13 cm. long, 2.5–4 cm. broad; main lateral nerves 5–6 pairs; petioles up to 5 mm. long, tawny pubescent. *Inflorescence* in axillary and terminal panicles, lax, up to 30 cm. long, 15 cm. wide, tawny-pubescent. *Cymes* decussate, 3–4 flowered; involucre bracts 4, with two additional bracteoles, free to the base, narrowly oblong or oblanceolate, grey-tomentose, 2–4 cm. long, 0.4–1 cm. broad; bracteoles shorter, linear, setaceous, about 6–13 mm. long; peduncles 5–7 mm. long. *Calyx* pedicelliform at base, tubular, funnel shaped, 5-toothed, densely tomentose without, appressedly hairy within, 7–8 mm. long; lobes crispate, triangular, acute, 2–3 mm. long. *Corolla* much exserted, 2-lipped; tube cylindric, slender, $\pm$ 7 mm. long, glabrous except the villous ring at the throat. *Stamens* 4, much exserted; filaments filiform almost orbicular. *Ovary* $\pm$ obovoid, glabrous, glandular towards apex; style slender, much exserted, $\pm$ 8 mm. long.

SUMATRA: In deep forests in Lampongs (Forbes 1,567: CAL, **holotype**; A, K, L & SING isotypes).

The presence of two linear-setaceous bracteoles between flower and involucre bracts is a special and distinct character found in no other species in the genus. Lam (1919, Key & text) described the number of these bracteoles as four, a number I have not found in any species. King & Gamble also mention two bracteoles only.

4a. *Congea forbesii* King & Gamble var. *ridleyana* Munir var. nov.
— **Fig. 4a.**

C. vestita Griff. in King & Gamble in Journ. As. Soc. Beng. LXXIV, II (1908) 865; Lam, Malay. Verb. (1919) 338; Ridley, Fl. Mal. Penin; II (1923) 640; Dop in Fl. Gén. Indoch. (1936) 911: Omnino quoad specimen Ridleyanum infra citatum.

A forma typica foliis ellipticis, inflorescentiis juventute dense fulvo-tomentosis saepe conspicuis pilis longioribus intermixtis; bracteis involucri late ellipticis vel oblongo-ellipticis, dense griseo-tomentosis, basi longis pilis canescentibus praeditis.

This variety differs from the type form, in its leaves being elliptic; young inflorescence densely fulvous-tomentose usually mixed with longer and conspicuous hairs; involucre bracts broadly elliptic or oblong-elliptic, thickly grey tomentose above, with long canescent hairs at the base above.

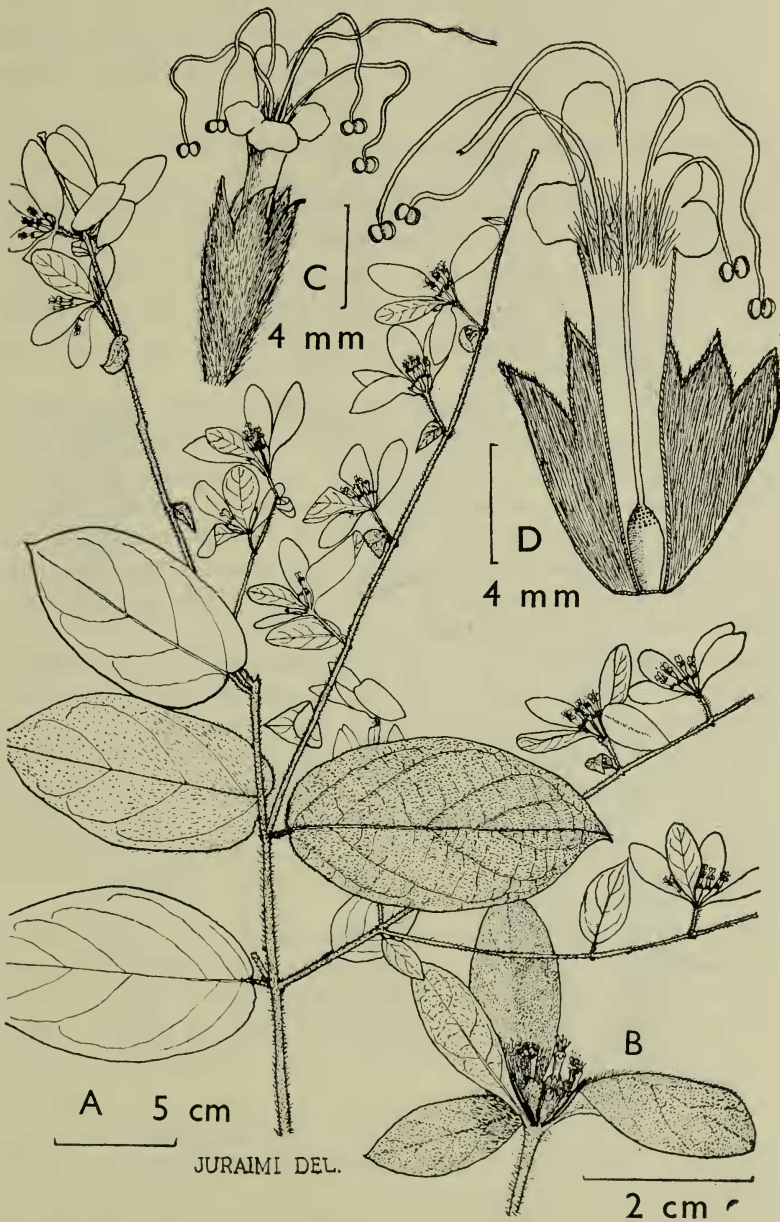


Fig. 4a. *Congea forbesii* var. *ridleyana* (Ridley 6,993 in SING).

A, Flowering twig. B, Cyme to show the additional pair of bracteoles and the shape of bracts. C, Flower. D, Flower vertically cut open.

MALAYA: **Province Wellesley**, Arakuda Woods (Ridley 6,993: SING, **holotype**; CAL, isotype). **Kedah**, Bukit Selambau, 100 ft. (Spare 37,314: A & SING); Jeniang-Selambau Road (Kadir SF. 35,803: SING; Wolfe & Kadir SF. 21,455: BM, KEP & SING); Sungei Batang (Dolman 21,509: KEP & SING); Baling, Kumpang Estate (Padaicher s.n.: SING).

SUMATRA: **Atjeh**, Bampoe-Serba (Pool s.n.: SING).

5. *Congea connata* Fletcher in Kew Bull. (1938) 208 & 440; Mold., Résumé Geogr. distr. & Syn (1959) 177 — **Fig. 5.**

Among all the species with 3-involucral bracts united into a cup at the base, *C. connata* is easily distinguished by its oblong leaves, narrowly elliptic-oblong involucral bracts, and longer cup (± 6 mm.) at the base.

Branchlets almost cylindric, canescent. *Leaves* chartaceous, oblong, acute towards apex, cordulate at base, nitid and glabrous above, pilose on the veins beneath, 7–16 cm. long, 2–4.5 cm. broad; main lateral nerves 4–5 pairs, prominent beneath; margins ciliate; petioles about 5 mm. long, pilose. *Inflorescence* in axillary and terminal panicles, canescent, 20–30 cm. long. *Cymes* 5-flowered; involucral bracts 3, united into a cup at the base, albo-canescant above, brownish below, narrowly elliptic-oblong, 2–3 cm. long, 0.5–1 cm. broad; cup ± 6 mm. long; peduncles 0.7–1.2 cm. long, canescent. *Calyx* tubular, 5-lobed, hirsute outside, appressedly hairy within; lobes ± 1.5 mm. long, pointed, crispate; tube 6–7 mm. long. *Corolla* protruding outside the calyx, 2-lipped, glabrous with a villous ring in throat; tube 8–9 mm. long; lobes rounded at apices. *Stamens* 4, inserted in corolla throat; filaments long, filiform, about 14 mm. long. *Ovary* oblong-obovoid, ± 1 mm. long; style upto 18.5 mm. long; stigma faintly two-lobed.

THAILAND: loc. incert. (Smitinand BKF No. 14,087:BKF).

Chanthaburi, Krat, Kao Saming (Kerr 17,913: E, **holotype**; BM, isotype); Kaw Chang, Klawng Mayom (Kerr 6,810: BM & E, paratypes); Koh Chang Island, east coast on the high banks of streams (Collins 569: BM, E & K, paratypes; Smith 306: BM & E, paratypes).

The author described the ovary as shortly pubescent at apex, though it is glandular at apex. Ovaries in this genus are always glabrous.

C. connata Fletcher (X ? *C. chinensis* Mold.)

The species proper is restricted to Thailand. But Alleizette s.n. (L) collected at Phan Rang in Annam (Vietnam), has 3–4 distinct bracts which are white above as in *C. connata*. In fact this appears to be a hybrid between *C. connata* and *C. chinensis*.

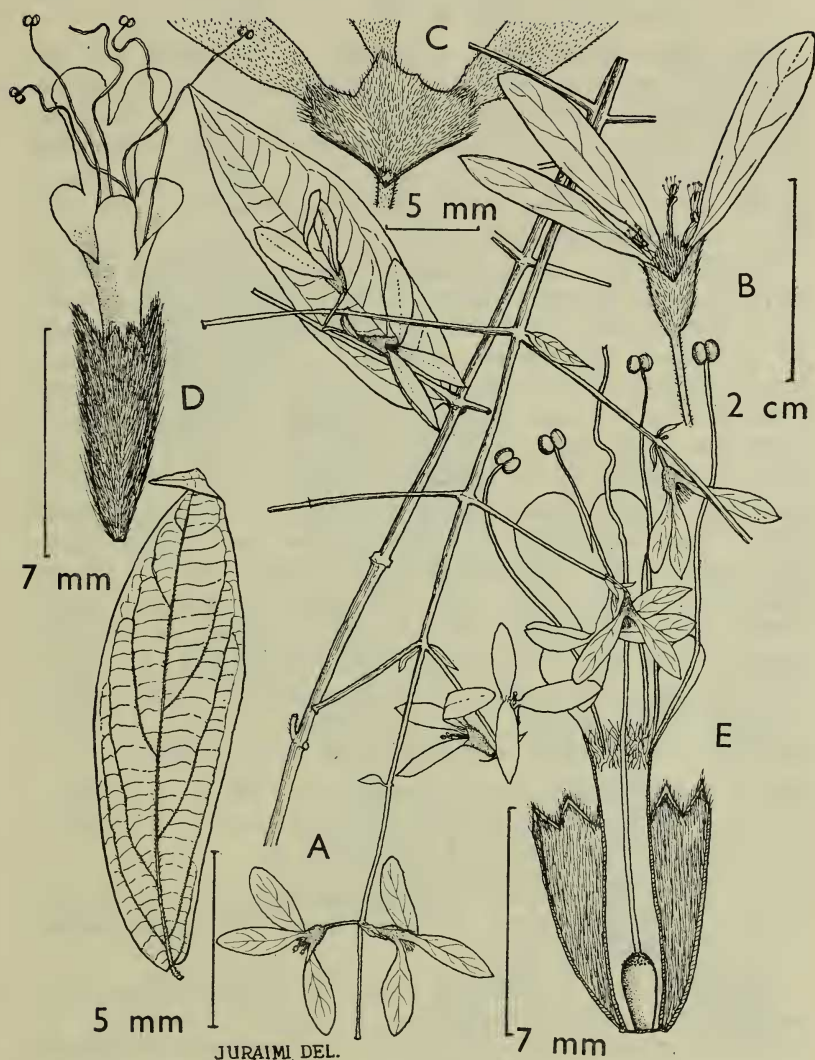


Fig. 5. *Congea connata* (Kerr 17,913 in E).

A, Inflorescence. B, Cyme showing the union of bracts at the base. C, Involucral cup cut open to show the angle between the bracts. D, Flower. E, Vertical section of the flower.

6. *Congea velutina* Wight, Ic. Ind. Or. III (1849) 15, t. 1479/3 or 1566 exclud. t. 1479/B; Clarke in Hook. f., Fl. Br. Ind. IV (1885) 603 & Fl. Koh Chang VIII (1904) 174; Briq. in Engl. & Prantl, Pflanzenfam. IV, 3a (1897) 181; Bakh. in Bull. Bot. Buitenz. III, Ser. 3 (1921) 161 *p.p.*; Dop in Fl. Gén. Indoch. IV (1936) 908 *p.p.*; Mold., Résumé Geogr. distr. & Syn (1959) 165, 179 & 275 *p.p.* — **Fig. 6.**

This species resembles *C. tomentosa* in the colour and the number of involucre bracts, but is distinguished by the bracts being spatulate and uniting into a distinct cup at the base. From *C. siamensis*, which also has 3-involucre bracts united into a cup at the base, *C. velutina* differs in its leaves being always cuneate towards the base; involucre bracts spatulate or oblanceolate, never emarginate; cup smaller (± 3 mm. long).

Branchlets terete, shortly pubescent. *Leaves* chartaceous, elliptic, acute-acuminate at apex, cuneate towards base, nitid and glabrous above, shortly pilose on the nerves beneath, up to 10.5 cm. long, 4.5 cm. broad; main lateral nerves 4–5 pairs; petioles 5–8 mm. long, pubescent. *Inflorescence* lax; panicles up to 30 cm. long, puberulous in the axis. *Cymes* 5-flowered; involucre bracts 3, united into a cup at the base, spatulate or oblanceolate, violet, thickly tomentose above, pubescent below, 2–3 cm. long, 1–1.5 cm. broad; Cup ± 3 mm. long; peduncles 1–1.5 cm. long, densely hairy. *Calyx* campanulate, 5-lobed, ± 5 mm. long, densely canescent hirsute outside, appressedly hairy within; lobes 1–1.5 mm. long, almost $\frac{1}{4}$ the way down, crispate in the margins, acute. *Corolla* exsert; tube longer than the calyx, ± 6 mm. long, glabrous except a villous band in the throat; upper lip very long (± 4 mm.); lobes rounded. *Stamens* 4, exsert; filaments filiform; anthers almost orbicular. *Ovary* obovoid, glabrous, glandular at apex, ± 1 mm. long; style filiform, long, exserted; stigma faintly bilobed.

BURMA: Mergui at Theinkun (Parker 2,579: DD & UC). [Moulmein], (Helfer K.d. No. 6,012: K); Ye Me near Tavoy (Helfer ? — mounted with Helfer K.d. No. 6,012: K).

THAILAND: West Coast, Ranong, Pakchang river at Mamoh (Kloss 6,703: K; Hamid 3,769: KEP & SING). Bangtaphan (Keith 2: SING).

This species was described as a *mixtum compositum* based on two Griffith's specimens from Mergui, depicted in Wight Ic. tt. 1479/3 and 1479/B. The lectotype is the specimen that formed the basis of Wight's t. 1479/3 which may be Griffith's 838 or its duplicate in Herb. Wight. I have seen neither. Wight t. 1479/B regarded by many as *C. tomentosa*, *C. velutina* or *C. villosa*, represents a distinct species having 4-involucre bracts which are free at base. It is described here as *C. griffithiana*.

This is the first species to be described as having a 3-bracteate involucre united into a distinct cup at the base. The bracts moreover are always spatulate or oblanceolate, never emarginate as

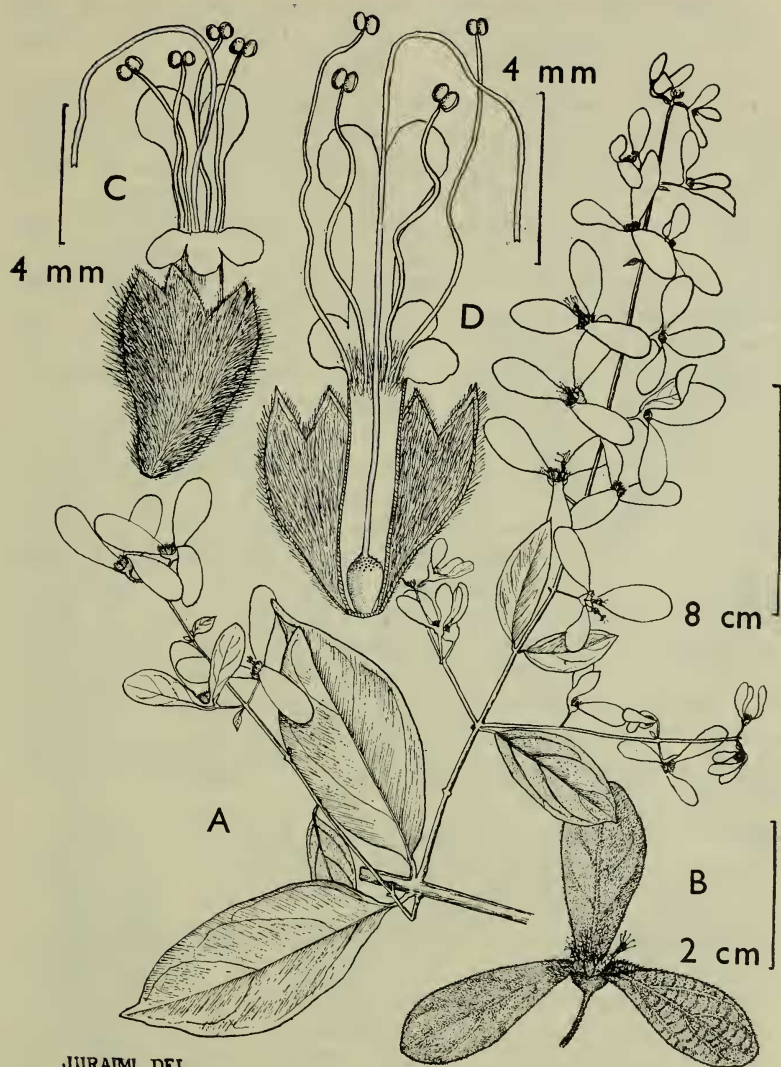


Fig. 6. *Congea velutina* (Parker 2,579 in UC).

A, Flowering twig. B, Cyme showing shape of its bracts and the cup at the base. C, Flower. D, Flower vertically cut open.

in *C. siamensis*. Clarke described the corolla of *C. velutina* as smaller and its tube shorter than the calyx. Actually, as described by Wight and shown in t. 1479/3, the corolla is much exserted and its tube is always longer than the calyx.

7. *Congea siamensis* Fletcher in Kew Bull. (1938) 209 & 440; Mold., Résumé Geogr. distr. & Syn. (1959) 177 & in Dansk Bot. Arkiv. 23, I (1963) 85 — **Fig 7.**

This species resembles closely *C. tomentosa* in its involucre bracts being 3, sometimes sub-4 which are densely tomentose and violet above, but is distinguished easily by the union of bracts forming a cup at the base and by the smaller calyx teeth.

Branchlets terete, densely canescent tomentose. *Leaves* subcoriaceous, elliptic or oblong-elliptic, acute or sub-acuminate at apex, cordulate or almost rotundate at base, glabrous above with puberulent midrib, pubescent beneath, 8–17 cm. long, 3–7 cm. broad; main lateral nerves 5–6 pairs, prominent beneath; intra-marginal nerve thin; petiole 0.5–1 cm. long, densely tomentose. *Inflorescence* in axillary and terminal panicles, canescent, up to 28 cm. long. *Cymes* up to 7-flowered or more; involucre bracts 3, occasionally sub-4, united into a cup at the base, obovate or broadly oblong-elliptic, often densely hoary in the upper surface, 2–3 cm. long, 0.7–1 cm. broad; cup $\pm$ 4 mm. long; peduncles 1–1.7 cm. long; densely hoary. *Calyx* campanulate, 5-lobed, densely hirsute outside, appressedly hairy within; $\pm$ 6 mm. long; lobes 1–1.5 mm. long, acute, crispate; tube almost 4.5 mm. long. *Corolla* exserted, bilabiate; tube cylindric, $\pm$ 7 mm. long or more, glabrous with a villous band in the throat. *Stamens* 4, inserted in the corolla throat; filaments much exserted, filiform, 13–25 mm. long; anthers almost orbicular. *Ovary* obovoid, glabrous, glandular towards apex, up to 2 mm. long; style very long, filiform; stigma indistinctly 2-lobed.

BURMA: **Tenasserim**, loc. incert. (Bot. Survey No. 379: CAL).

Tavoy, Zinba Chaung alt. 200 ft. (Ba Pe 804: CAL); Myitta (Parker 2,393: UC); Maungmagon (Parker 2,161: A & DD).

THAILAND: loc. incert. (Smith 314: A). **Prachinburi**, Krabin, Ban Keng (Kerr 19,792: E, **holotype**: BM, isotype; Marcan 2,529: E). **Rachaburi**, Kanburi, Siswat (Kerr 10,166: BM, E & K, paratypes; Boonkrong 7: BKF & K; Sangkhachand 757, BKF & K; Phengkhlai 175: BKF); Kawae Menam Noi, at Sai Yok (Larsen 8,723: A; 9,167: E).

This species is often confused with *C. tomentosa* because of the resemblance in the number and colour of their involucre bracts; but the inflorescence axis of *C. siamensis* is less tomentose, involucre bracts and the calyx teeth shorter and has a conspicuous involucre cup. *C. connata* is very close to this in having an involucre cup, but the cup itself is much longer (16 mm.) and the involucre bracts are always 3 and whitish.

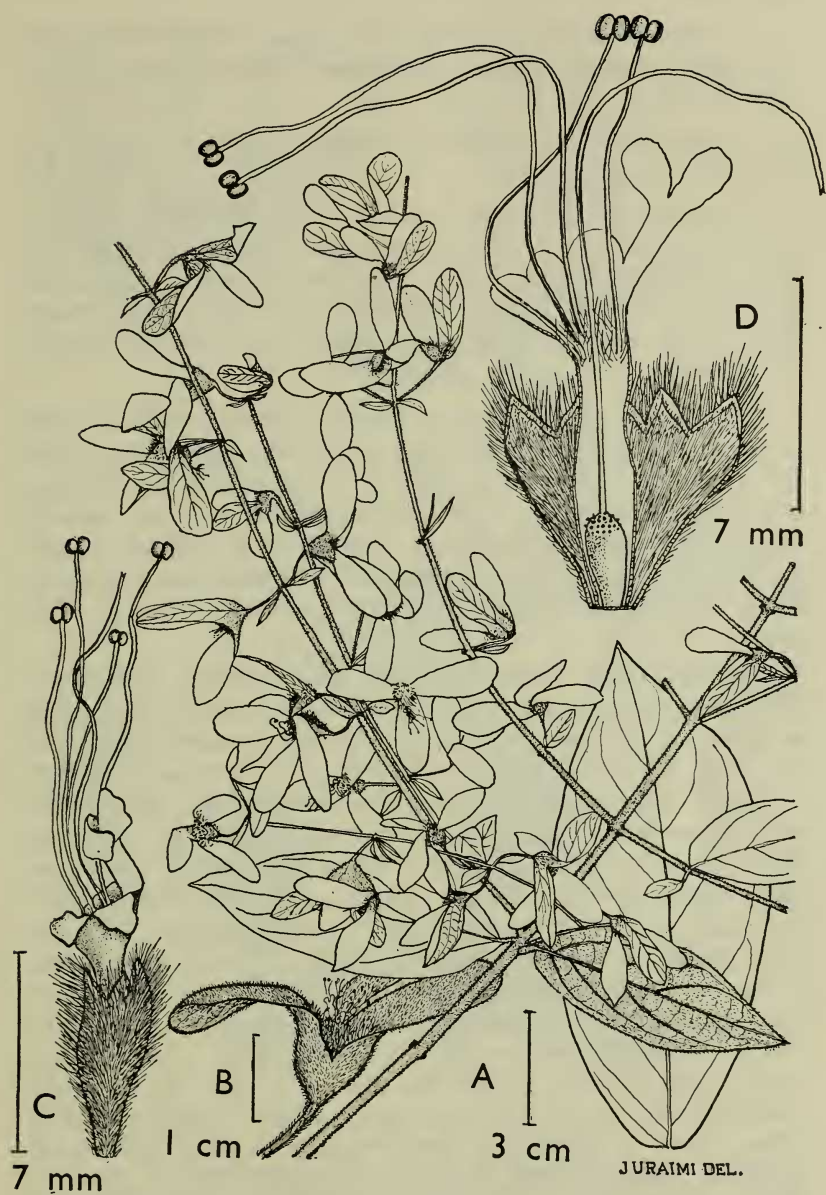


Fig. 7. *Congea siamensis* (Kerr 19,792 in E).

A, Inflorescence twig. B, Cyme to show the bracteal cup. C, Flower. D, Flower longitudinally cut open.

8. *Congea pedicellata* Munir sp. nov. — Fig. 8.

C. peteloti Mold., Résumé Geogr. distr. & Syn. (1959) 175 p.p., non typica.

C. tomentosa Roxb. sec. Dop in Fl. Génér. Indoch. IV (1936) 913, quoad specimen Poilanei Laosianum; Mold., Résumé Geogr. distr. & Syn. (1959) 175 p.p.

C. vestita Griff. sec. Dop in Fl. Génér. Indoch. IV (1936) 911 excl. parte typica.

A C. vestita cui affinissima, rumulis foliferis floriferisque minute cinereo pubescentibus; foliis ellipticis basi plerumque rotundatis, raro cordulatis, chartaceis, superne scabridulis inferne pubescentibus (non hirsutis); bracteis involucri elliptico-obovatis, griseo-albidis; floris pedicello longiore; calycibus externe minute cinereo-pubescentibus haec species differt.

Akin closely to *C. vestita* in having 3-involucral bracts free to the base, flowers pedicellate and corolla-tube shorter than calyx, but it can be distinguished easily by its branchlets and inflorescence axis being finely cinereo-pubescent; leaves elliptic, usually rounded at base (rarely cordulate), chartaceous, scabridulous above, grey-pubescent beneath; involucral bracts elliptic-obovate, greyish-white; flower-pedicels longer; calyx finely cinereo-pubescent without.

Branchlets terete, cinereo-pubescent. *Leaves* elliptic, chartaceous, acute-acuminate at apex, usually rounded but sometimes cordulate at base, scabridulous above, grey-pubescent beneath, up to 14.5 cm. long, 6 cm. broad; main lateral nerves 4–6 pairs; petiole 5–7 mm. long, cinereo-pubescent. *Inflorescence* in axillary and terminal panicles; axis cinereo-pubescent; panicles up to 25 cm. long. *Cymes* 7-flowered; involucral bracts 3 (or sub-4), free to the base, elliptic-obovate, densely covered with fine greyish white tomentum, up to 3 cm. long, 1.5 cm. broad; peduncles 1–2.5 cm. long, greyish pubescent. *Flowers* pedicellate. *Calyx* campanulate, 5-lobed, up to 8 mm. long, cinereo-pubescent without, appressedly hairy within; lobes almost one-third the length of the calyx tube, acute, crispate in the margins, 1.5–2 mm. long; tube cylindric when young, later broader towards apex, 6–6.5 mm. long. *Corolla* bilabiate; tube shorter than the calyx, cylindric, glabrous with a villous band in the throat; lobes rounded at apex. *Stamens* 4, exserted; filaments long; anthers $\pm$ orbicular. *Ovary* obovoid, glabrous, glandular at apex, $\pm$ 1.5 mm. long; style long, exserted; stigma faintly bilobed.

LAOS: **Bassin du Se-Moun**, at Khone (Harmand 139: A). **Bassac á ubon** (Thorel 2,639: A); Ban Tha Ngon Road (Talbot 103: BM & SING); Prov. de Savannakhet (Poilane 13,683: A).

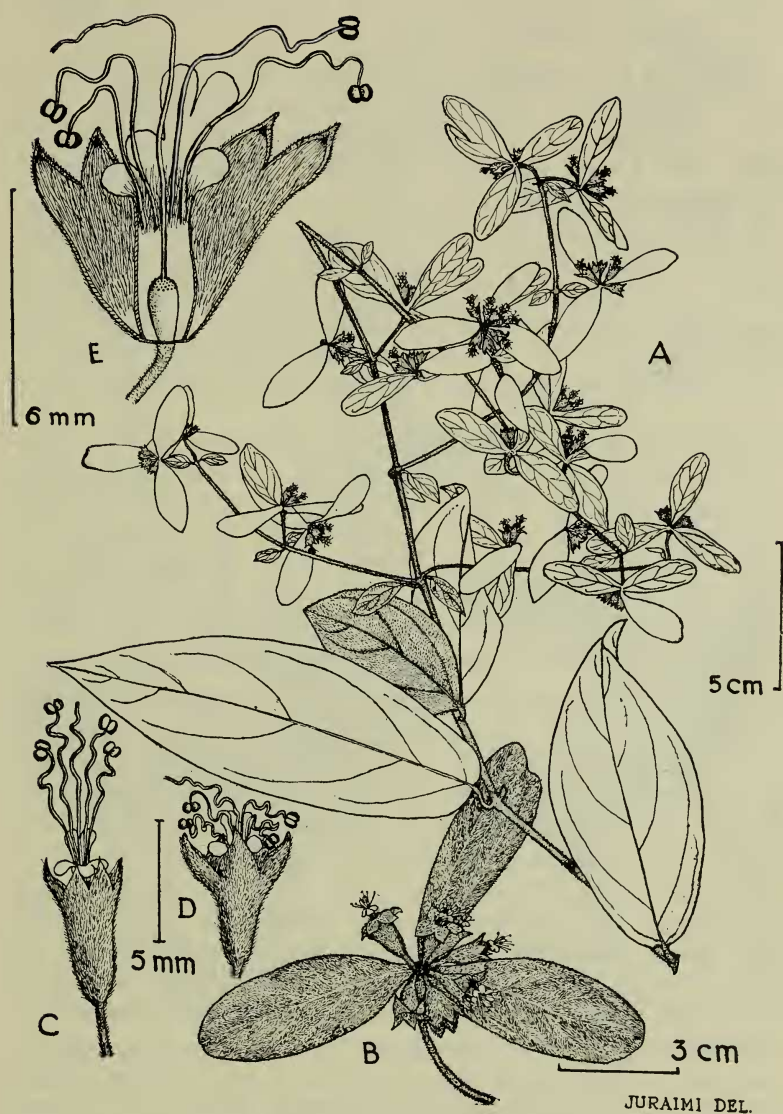


Fig. 8. *Congea pedicellata* (Pierre s.n. in B, holotypus).

A, Fertile twig. B, Cyme showing its bracts and flowers. C, Flower to show its distinct pedicel. D, Flower with a shorter pedicel but with longer calyx teeth from the same cyme. E, Vertically cut open flower shows corolla-tube in its relation to the length of calyx.

VIETNAM: loc. incert. (Poilane 11,674: A & B). **Cochinchine**, loc. incert. (Pierre s.n.: B, SING & UC); Dong nai (Pierre s.n.: B, **holotype**; A. B & SING isotypes); Baria (Pierre s.n.: UC); Bien Hoa (Thorel 648: A, B & UC; Alleizette 5,723: L); Saigon-Djiring, alt. 600 M. (Smitinand & Abbe 6,371: K). **Tonkin**, Ninh Binh (Alleizette s.n.: L).

Almost all the specimens of this species have been quoted by Dop (1936) under *C. vestita*, while Moldenke has annotated some of the specimens as *C. tomentosa* Roxb. and some as *C. peteloti* Mold. with a note that they have been "cited by him in his Monograph of the genus".

True *C. peteloti* Mold. is a form of *C. tomentosa* var. *nivea* which has sessile flowers and a corolla tube longer than the calyx. From *C. vestita* this species differs in its fine, very short, whitish indumentum on the branchlets, inflorescence axis, peduncles and calyces; the leaves are chartaceous cinereo-pubescent; involucre bracts much narrowed to the base, and flower pedicels longer.

9. *Congea vestita* Griff., Notul. IV (1854) 174 & Ic. Pl. As. t. 458, fig. 21; Clarke in Hook. f., Fl. Br. Ind. IV (1885) 603; Briq. in Engl. & Prantl, Pflanzenfam. IV, 3a (1897) 181; King & Gamble in Journ. As. Soc. Beng. LXXIV, II (1908) 865 pro parte typica; Lam, Malay. Verb. (1919) 338 p.p.; Ridl., Fl. Mal. Penin. II (1923) 640 pro parte typica; Dop in Fl. Génér. Indoch. IV (1936) 911 p.p.; Mold., Résumé Geogr. distr. & Syn. (1959) 165, 177 & 179 p.p. var. **vestita** — **Fig. 9.**

C. tomentosa Roxb. sec. Wight, Ic. IV, 3 (1849) 15 t. 1479/2 or 1565; et Miq., Fl. Ind. Batav. II (1858) 911; Clarke in Hook. f., Fl. Br. Ind. IV (1885) 603; King & Gamble in Journ. As. Soc. Beng. LXXIV, II (1908) 866; Bakh., in Bull. Jard. Bot. Buitenz. III, Ser. 3 (1921) 100; Dop in Fl. Génér. Indoch. IV (1936) 911; omnino quoad Iconem Wightianam supra citatam.

Allied closely to *C. tomentosa* in having 3 to sub-4 involucre bracts free to the base, but is readily distinguished by its flowers being long pedicelliform; involucre bracts broadly-elliptic or elliptic obovate, light cream coloured, more densely tomentose; corolla-tube shorter than calyx; and ferruginous hirsute twigs.

Branchlets cylindrical, ferruginous hirsute. *Leaves* coriaceous ovate, acute-acuminate at apex, cordulate at base, scabrid-pubescent above, ferruginous tomentose beneath; up to 16 cm. long, 7.5 cm. broad; main lateral nerves 5–6 pairs; petiole 5–7 mm. long, ferruginous hirsute. *Inflorescence* in axillary and terminal panicles, ferruginous hirsute in the axis; panicles up to 30 cm. long. *Cymes* (mature) 7-flowered; involucre bracts 3 (or sub-4), free to the base, broadly elliptic, not attenuate towards base, light cream coloured, densely tomentose, 2–4 cm. long, 1–2 cm. broad; peduncles up to 2.5 cm. long, patently ferruginous hirsute. *Flowers* pedicelliform; pedicels up to 2 mm. long. *Calyx* almost funnel

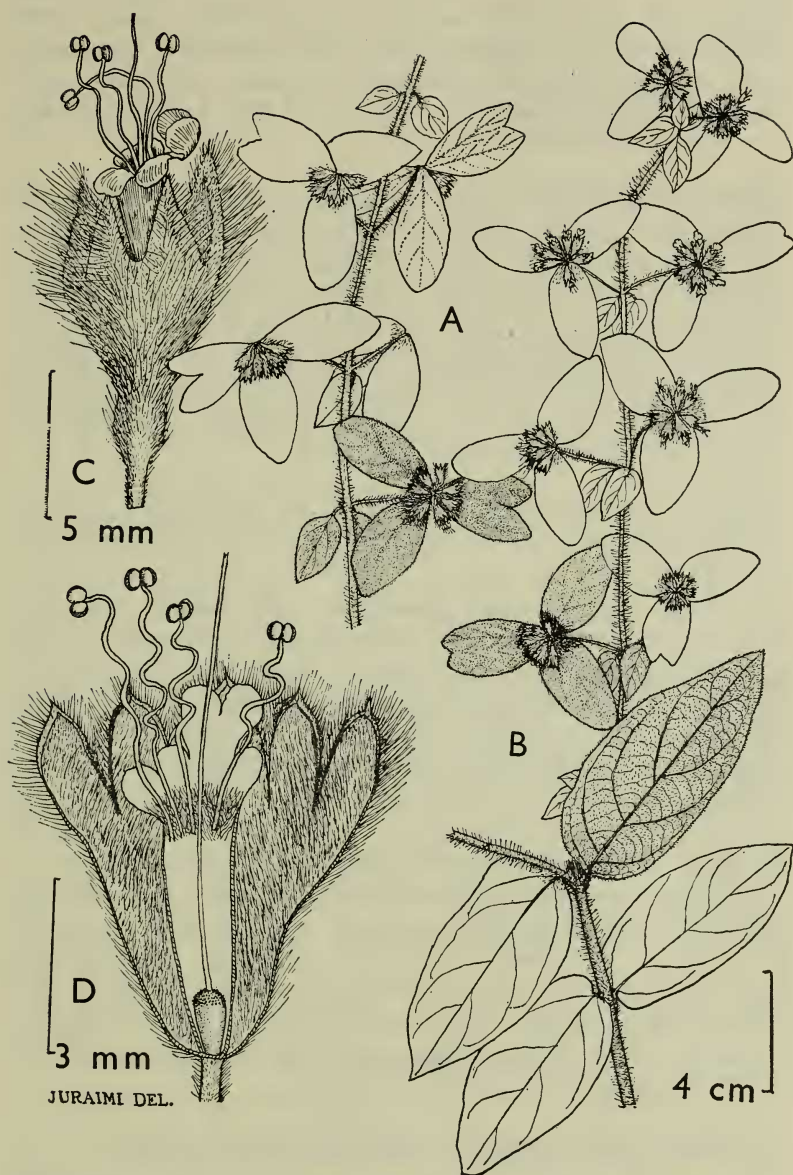


Fig. 9. *Congea vestita* (A. Griffith 898 in E; B-D, Beddome 6,530 in BM).

A & B, Parts of inflorescence show the hirsute axis. C, Flower showing short pedicel and long calyx-lobes. D, Flower dissected to show size of corolla-tube in its relation to calyx.

shaped, 5-lobed, up to 7 mm. long, densely hirsute within and without; lobes almost $\frac{1}{2}$ the length of the calyx-tube, ovate-lanceolate, up to 3 mm. long, crispate in the margins; tube 4-5 mm. long. *Corolla* tube shorter than the calyx, cylindric, glabrous with a villous band in the throat; lobes rounded, glabrous. *Stamens* 4, exsert; filaments thread like; anther lobes almost orbicular. *Ovary* obovoid, glabrous, glandular at apex $\pm$ 1 mm. long; style long, exsert; stigma indistinctly 2-lobed.

BURMA: **Martabania**, Papun (Meebold ? 16,999: CAL); Donat range, alt. 1,500 ft. (Beddome 6,530: BM); Amherst, Puye to Thagahta (Lace 5,591: CAL, E & DD; s. loc. [Prob. Moulmein] (Helfer K.d. No. 6,014: A). **Tenasserim**, Mergui (Griffith 898: E, **holotype**; K.d. No. 6,014: K, isotype; Meebold 14,078: CAL & NY); Crown Rubber Estate (Rogers 406: CAL; s. loc. [Prob. Griffith's coll. from Mergui] (Wight K.d. No. 2,305: K); Sanawut (Lace 4,802: CAL, E & K); Island of Mergui (Proudlock 44: CAL); loc. incert. (Pachman 116: BM).

CULTIVATED: **Java**, Hort. Bot. Bogor, XV. E. 70 (Leg. ? NY). **U.S.A.**, Botanical Garden, Bronx Park, New York (Moldenke 9,454: NY).

Misled by the erroneously placed line in Roxburgh's *Flora* that made the holotype specimen also from the Coromandel, Wight described this species as *C. tomentosa* Roxb. However, both his description and the plate were based on Griffith's collection which may be duplicate from the type collection of *C. vestita* and which probably represented by the specimen distributed from Herb. Wight under Kew No. 2,305 or by K.d. No. 6,014 in Kew. There are two "K.d. No. 6,014 in Kew"; one is Helfer's specimen in Arnold Arboretum and the other Griffith's from Mergui in Kew.

As shown in my revision of *Sphenodesme*, under *S. involucrata* (Presl) Rob. (*Gard. Bull. Sing.* Vol. 21, in press), Helfer collected in Moulmein (Martabania) and in the Andamans; but since this species does not occur in the Andamans, Helfer's specimen distributed under Kew No. 6,014 was probably also from Moulmein.

Specimen from Donat Range attributed by Clarke (1885) to Griffith is probably an error for Beddome.

9a. *Congea vestita* Griffith var. *subvestita* Munir var. nov.

A forma typica ramulis foliferis floriferisque paginis foliorum inferioribus flavido-pubescentibus, haud hirsutis, haec varietas facile distinguitur.

This variety can be readily distinguished from the type form by its branchlets, inflorescence axis and underside of leaves being faintly yellowish pubescent, not hirsute.

VIETNAM: **Phan Rang**, Daban, alt. 650 ft. (Kloss s.n.: BM, **holotype**).

This variety differs from the type form only in the shorter indumentum, a character that might represent either a pure form or a modification through hybridisation. The species most likely to effect such a change in the progeny of *C. vestita* is by its being crossed with *C. pedicellata* or *C. tomentosa* var. *nivea*.

10. *Congea tomentosa* Roxb., Pl. Corom. III (1819) 90, t. 293; Walp., Repert. IV (1844) 117; Schauer in DC. Prodr. XI (1847) 623; Wight, Ic. Ind. Or. IV, 3 (1849) 15 excl. Ic. 1479/2 et descript.; Miq., Fl. Ind. Batav. II (1858) 911 p.p.; Kurz, For. Fl. Burma (1877) 256; Clarke in Hook. f., Fl. Br. Ind. IV (1885) 603 p.p.; Briq. in Engl. & Prantl, Pflanzenfam IV, 3a (1897) 181; King & Gamble in Journ. As. Soc. Beng. LXXIV, II (1908) 866 quoad protologum tantum; Craib in Kew Bull. (1911) 445 p.p.; Hall. f. in Meded. 's Rijks Herb. Leiden No. 37 (1918) 86 p.p.; Lam, Malay. Verb. (1919) 338 p.p.; Bakh. in Bull. Jard. Bot. Buitenz. III, Ser. 3 (1921) 100 p.p.; Boynton in Addisonia Vol. 13 (1928) 19 t. 426; Dop in Fl. Génér. Indoch. IV (1936) 911 p.p.; Fletcher in Kew Bull. (1938) 440 pro parte typica; Mold., Résumé Geogr. distr. & Syn. (1959) 159, 165, 175, 177, 179, & 275 p.p. and in Dansk Bot. Ark. 23, I (1963) 85: var. ***tomentosa*** — **Fig. 10.**

C. tomentosa Roxb. var. *azurea* (Wall. ex Walp.) Clarke in Hook. f., Fl. Br. Ind. IV (1885) 604; Dop in Fl. Génér. Indoch. IV (1936) 913; Fletcher in Kew Bull. (1938) 440; Bor & Raizada, Ind. Clim. & Shrubs (1954) 140, fig. 89; Mold., Résumé Geogr. distr. & Syn. (1959) 161, 165, 177, 179 & 275: (**nom. superfluum**) **Syn. nov.**

C. tomentosa Roxb. var. *caerulea* (Wall.) Clarke sec. Briq. in Engl. & Prantl, Pflanzenfam. IV, 3a (1897) 181. **nom nudum.**

C. tomentosa Roxb. var. *oblongifolia* Schauer in DC. Prodr. XI (1847) 624. **syn. nov.**

C. azurea Wall. Cat. (1828) 1733 1 & 2: nom. nud.; ex Walpers, Repert. IV (1844) 116; Wight, Ic. Ind. Or. IV, 3 (1849) 15, t. 1479/1, fig. A: (**nom superfluum**). **syn. nov.**

“*C. villosa* (Roxb.) Wight” ex Clarke in Hook. f., Fl. Br. Ind. IV (1885) 603; Briq. in Engl. & Prantl, Pflanzenfam. IV, 3a (1897) 181; Bakh. in Bull. Jard. Bot. Buitenz. III, Ser. 3 (1921) 100; Mold., Résumé Geogr. distr. & Syn. (1959) 165, 175, 177, 179 & 275: Omnino pro parte typica. **syn. nov.**

Calochlamys capitata Presl, Bot. Bemerk. (1844) 149; Walp., Repert. VI (1846) 691.

Roscoea tomentosa Roxb., Fl. Ind. III (1832) 56 & ed. Clarke (1874) 477: **typonym tantum.**

R. villosa Roxb. Fl. Ind. III (1832) 55 & ed. Clarke (1874) 477. **syn. nov.**

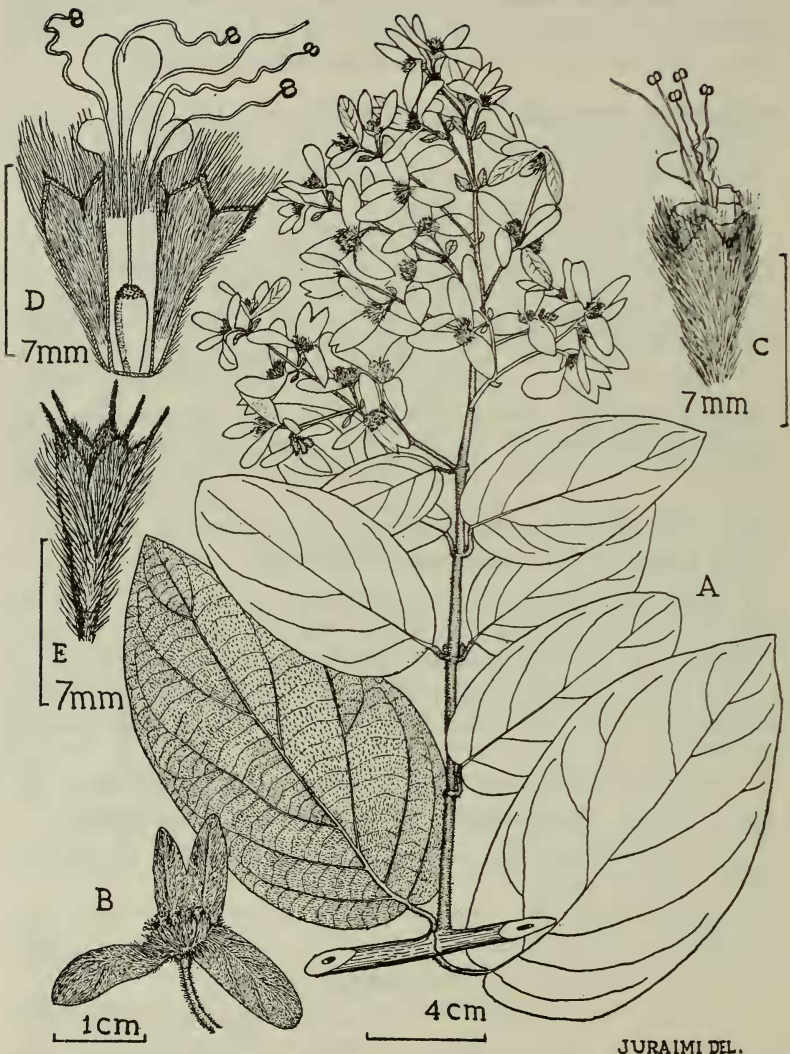


Fig. 10. *Congea tomentosa* var. *tomentosa* (A-D, Lace 2,176 in E; E, Hodge 3,654 in A).

A, Flowering twig. B, Cyme with one of its bracts deeply emarginate. C, Flower at pre-anthesial stage without accessory-teeth on calyx lobes. D, Flower longitudinally cut open. E, Calyx at post-anthesial stage, with accessory teeth on the lobes (corolla removed).

Among all the species having 3 (or sub-4) free bracts to an involucre, *C. tomentosa* can be easily distinguished by its adult bracts being violet; flowers sessile; calyx lobes (at anthesis) are provided with fine, long accessory teeth, and corolla-tube is longer than the calyx.

Branchlets almost cylindric, fulvescent tomentose when young, later canescent. *Leaves* elliptic-ovate, usually acuminate at apex, (rarely obtuse), cordulate at base, puberulent above when young, later glabrous, thickly pubescent beneath, up to 18.5 cm. long, 9.5 cm. broad; main lateral nerves 5-6 pairs; intramarginal nerve prominent; petiole 5-13 mm. long, deeply striate dorsally, pubescent. *Inflorescence* in axillary and terminal panicles; axis fulvescent tomentose; panicles 12-30 cm. long. *Cymes* usually 7-flowered, (rarely 5 or 9-flowered); involucre bracts 3, occasionally sub-4, free to the base, 2-3 cm. long, 8-12 mm. broad; elliptic-oblong, violet, tomentose, provided at the base above with long, canescent hairs, peduncles 1-1.8 cm. long, densely pubescent. *Flowers* sessile. *Calyx* infundibuliform, 5-lobed, densely sericeo-hirsute outside, appressedly hairy within, 5-7 mm. long; accrescent lobes well developed, almost half the length of calyx tube, 1-2.5 mm. long, acute, often bearing a linear setaceous accessory tooth at the tip; tube 4-5 mm. long. *Corolla* tube longer than the calyx, cylindric, glabrous except a narrow (almost fugacious) villous band in the throat. *Stamens* 4; filaments much exerted, filiform; anthers almost orbicular. *Ovary* obovoid, glabrous, glandular at apex, $\pm$ 2 mm. long; style long, exerted; stigma faintly bilobed.

EAST PAKISTAN: Chittagong Hill Tracts (Lace 2,176: CAL & E; Lister 89: CAL; Cowan 244, 802, 1,679, 1,899, 2,377 & s.n.: E).

INDIA: Assam, Lushai Hills, at Che Raun (Parry 609: K). **Manipur**, at foot of Kabsome, alt. 3,500-4,000 ft. (Watt 5,105: CAL & K); on the eastern frontier of India (Watt 5,055: CAL & E).

BURMA: Upper & Central Burma, loc. incert. (King s.n.: CAL; Collet 48: CAL); Taipinho valley, on the slopes (Forrest 1,144: A, BM & E; 9,586: E); Pintta (Prazer 36: CAL); Ruby mines (Abdul Huk 208: CAL); Madoe Hills (Mundul 86: CAL); Kachin Hills (Mokim 25: CAL & L; s.n.: CAL); Myitkyina (Pottinger s.n.: CAL); loc. incert. (Huk s.n.: CAL & L; Candler s.n.: CAL); Bilakatgyi [Shan State] (Watt 16: E; Maunders s.n.: CAL); Mangsath (Fulton sub Watt No. 10,770: CAL & E); Taung-gyi, alt. $\pm$ 5,500 ft. (MacGregor 1,120: CAL & E); Ta Kaw and Meh Soi (Rock 1,691: A); between Ban Meh Huak & Pang mah Ki Hat (Rock 1,923: A & UC); Bhamo (McMillen 201: UC; Anderson in 1868, s.n.: CAL); Katha, Kadu (Haines 5,776: K); Hsipaw, alt. 760 m. (McKee 5,986: K); Maymyo, Singaung Kyaing, alt. 3,000 ft. (Mg Kan 260: CAL); Magwe, Yabe Reserve, alt. 500 ft. (Rogers 597: CAL, DD & E); Minbu, Nwamadaung Hills (Aubert & Gage s.n.: CAL; Parkinson

15,700: DD); Victoria range, Chauktu, alt. 1,300 ft. (Kingdon-Ward 21,729: BM). **Prome & Karenni**, Prome (Toppin 2,557: E; Leg. ? s.n.: E); Nwezat, Taungbzank (Lace 2,724: CAL, E & K); Toungoo, Thandaung, alt. 1,500 ft. (Chin 4,366: CAL); Myaungmya (Dickason 6,927: A). **Pegu** (McLelland s.n.: A & CAL; Kurz 1,039 & 2,398: CAL; Brandis 878: DD; 880: CAL; Leg. ? 429: CAL). **Insein**, Maukhlaing Reserve, alt. 100 ft. (Khant 82: A & DD); Wanetchaung (Mg Kan 270: CAL). **Rangoon**, Rangoon (Parkinson 13,930: A; Weiste No. X.P.L.I.: BM; Dickason 3,142 & 5,662: A; Meebold 14,047: CAL; McLelland s.n.: E; Leg. ? 104 & s.n.: CAL). **Martaban**, Moulmein, [probably Amherst] (Wallich 1,733 a/: K; 1,733 (1): E); Amherst (Wallich 1,733: CAL; Dickason 6,869: A; Falconer 2: CAL); Moulmein (Beddome 6,531 & 6,533: BM; s.n.: SING; Loble s.n.: K; Helfer: K.d. No. 6,013: K; Prague Bot. Mus. No. 28: A, B, BM, E, L, NY & Bohemiae Herb. No. 53: CAL, probably isotypes of *Calochlamys capitata* Presl). **Tenasserim**, Mingatown (Gallatly 13: BM & CAL); Mergui (Griffith, sub Kew distr. No. 6,013: A).

THAILAND: loc. incert. (Vanpruk 163: K); Jampang (Kerr s.n.: BM). **Chiengmai**, alt. 1,000 ft. (Kerr 533: BM & K; Hosseus 370: BM, E & L); Doi Sutep (Native 3,810: A); Loei Wang Saphung, Sithan (Nakkarn 82: K; Bunpheng 472: BKF). **Kamphaeng Phet**, 50 km. towards East (Larsen & Hansen 6,636: BM). **Pitsanulok**, Petchabun, alt. 50 m. (Kerr 6,368: BM & E). **Rachaburi**, Kwai Noi River Basin Expedition (Kasin 162: A, K & L); Prachuap, Kan Kradi (Put 2,283: BM & E). **Prachinburi**, Sriracha (Collins 359: K).

LAOS: **Muong You** (Spire 749: B; s.n.: A); Trannih (Petelot 1,539: A & UC).

VIETNAM: **Annam**, Vinh, Cua Rao (Poilane 19,977: A).

CHINA: **Yunnan**, Salwin valley, Shweli, alt. 5,000 ft. (Forrest 29,388: BM & E); loc. incert. (Anderson in 1875 s.n.: CAL); Chen-Kang Hsien, alt. 2,000 m. (Wang 72,678: A).

CULTIVATED: Parks or Botanic Gardens: **India**, Calcutta (s.n.: CAL, E & L; Leg. in 1813: A; on 16/1/28: CAL; Ex Herb. Wight Prop. in 1882 ? : A & CAL); Sibpur (Raizada in 1953: DD); Dehra Dun (Raizada in 1941 & in 1942 and Balapure in 1956: DD); Travancore at Trivandrum (Erlanson 5,368: NY); Serampore (Griffith 9,331: BM). **Burma**, Rangoon (Bernard X.P.L.I.: BM). **Singapore** (Deshmukh on May 4th 1930 & 14/9/21: SING; Furtado on Nov. 15th 1927: SING & UC; Noor on September 23rd 1918: SING). **Indonesia**, Bogor XV: E. 70 (Leg. s.n.: NY). **West Indies**, Dominica at Roseau (Hodge 3,654: A). **Hispaniola**, at Haiti (Ekman 9,963: NY). **Cuba**, Soledad (Eames on March 7th, 1948: UC); Santa Clara, Cienfeugos (Jack 8,486: SING). **U.S.A.**, Florida, Miami, Kwekerij Wilson (Boom 38,552: L); Champan field, Coconut Grove (Moore 6,007:

BM); New York, Bronx Park (Moldenke 9,454: BM & NY); Porto Rico (Britton and Boynton 8,165: NY).

Fletcher (1938) was unaware that Walpers (1844) had validated *C. azurea* Wall. which was later amended by Wight (1849) to exclude *Roscoea villosa* Roxb. from its synonymy. Otherwise he would have seen that *C. tomentosa* var. *azurea* (Wall. ex Wight) Clarke is an erroneous expression for the variety. All specimens Fletcher cited under var. *azurea* belong to the type form of *C. tomentosa*.

C. azurea Wall. from Martaban 1827 is numbered in Herb. Hookerianum (now in Kew) as 1733-a/; while its duplicate in Herb. Edinburgh is numbered 1733 (1), and bears a name in pencil " = *Sphenodesme azurea*". The same secondary determination is found on McLelland's sheet from Rangoon district in Herb. Edinburgh. This may be the basis for Clarke's quoting "Wall. 1733 partly" under *Sphenodesme pentandra* Jack.

Wight (1849) described the corolla tube of *C. azurea* (text & Ic.) being shorter than the calyx and glabrous within. But the corolla tube in this species is longer than the calyx and is provided with a narrow, almost fugacious villous band in the throat.

In many mountainous specimens the involucre bracts usually become broad elliptic and almost free to the base, being slightly united at the base; but sometimes as in Lister 89 from Chittagong Hill tracts and in many from the lowland specimens, the bracts are narrow-oblong and quite free to the base. The calyx lobes of both these forms develop fine, aristate-like accessory teeth. In all cultivated specimens obtained from different parts of the world, the bracts are always narrow and free at the base. Is this an ecological response?

Prague Mus. no. 28 and Bohemiae Herb. no. 53 are distributed from Czechoslovakia as specimens from "India orientalis, in Bengalica circa Calcuttam", where this species never occurs wild. But as shown in my notes under *Sphenodesme involucreata* in *Gard. Bull. Sing.* (Vol. 21 in press), these specimens must be from Moulmein where Helfer had collected, since in the Andamans (the other place where Helfer had botanized), no species of *Congea* is found. As suggested in my previous notes, Helfer who was also from Prague, probably corresponded with Presl who was on the staff of the Prague University and so presumably these specimens of Helfer's bearing different numbers are from the collection which supplied the holotype of *Calochlamys capitata* Presl. Hence one seems justified to regard these specimens as isotypes of the species.

All the definitely known specimens of *Congea* collected by Griffith were from Mergui where he botanized. Therefore, the great probability is that Griffith's specimen distributed under Kew distr. No. 6,013 is also from Mergui. There are two specimens bearing K.d. No. 6,013; one is Helfer's in Kew and the other is of Griffith in Arnold Arboretum.

Wallich in his Catalogue listed his *Congea azurea* 1733 (1) as from Martabania while the other 1733 (2) was from Prome, much to the north of Martabania. However, in Herbarium Calcutta, there is a specimen collected by Wallich and numbered 1733 labelled as being from Amherst. This suggests that all his Martabania plants bearing No. 1733 are from this Amherst collection.

Since Roxburgh had grown in the Botanic Gardens, Calcutta, a progeny of the holotype plants of *C. tomentosa* and *C. villosa* (cf. Hortus Bengalensis, 1814), great importance has to be given to these specimens in interpreting Roxburgh's species, especially those that were collected during Roxburgh's time or soon after his death (cf. introduction). As to the specimens obtained from the Calcutta Gardens and distributed "Ex Herb. Wight," see the introduction in this paper under "Progeny of the Types".

As to the status of the combination "*C. villosa* (Roxb.) Wight" and "*C. villosa* Wight", see the nomenclatural note on *C. griffithiana*.

10a. *Congea tomentosa* Roxb. var. *nivea* Munir var. nov. — Fig. 10a.

C. oblonga Dop in Bull. Soc. Bot. France, LXI (1914) 320 & in Fl. Génér. Indoch. IV (1936) 910: Mold., Résumé Geogr. distr. & Syn. (1959) 175. **syn. nov.**

C. peteloti Mold., Phytologia III (1951) 409; & Résumé Geogr. distr. & Syn. (1959) 175 p.p. **syn. nov.**

C. tomentosa Roxb. sec. Fletcher in Kew Bull. (1938) 440, quoad specimina citata.

C. velutina Wight sec. Dop in Fl. Génér. Indoch. IV (1936) 909, quoad specimen Evrardianum infra citatum.

C. vestita Griffith sec. Dop in Fl. Génér. Indoch. IV (1936) 911 p.p.

A forma typica ramulis foliferis floriferisque etiam juventute cinereo tomentosis, bracteis involucris obovatis vel late ellipticis, albo tomentosis, vivo interdum paulo violascentibus, calycibus externe cinereo-pubescentibus, lobis ejusdem tres unciae longis vel brevioribus, episepala non ferentibus; corollis in fauce latius villosa haec varietas sat distincta.

From the type form this variety can be distinguished by its branchlets and inflorescence axis being cinereo-tomentose even when young; involucral bracts obovate or broadly elliptic, white tomentose, sometimes tinged mauve when fresh. Calyx cinereo-pubescent without, lobes one-third the length of calyx-tube or shorter with no accessory teeth; corolla with a broader villous band in the throat.

THAILAND: **Nakawn Sawan**, Takli (Put 2,101: BM & E; Marcan 1,072: BM & E). **Rachasima**, Pak Chawng (Marcan 1,550: BM & E). **Chantaburi**, Chantabun, Makam (Lakshnakara 491: BM

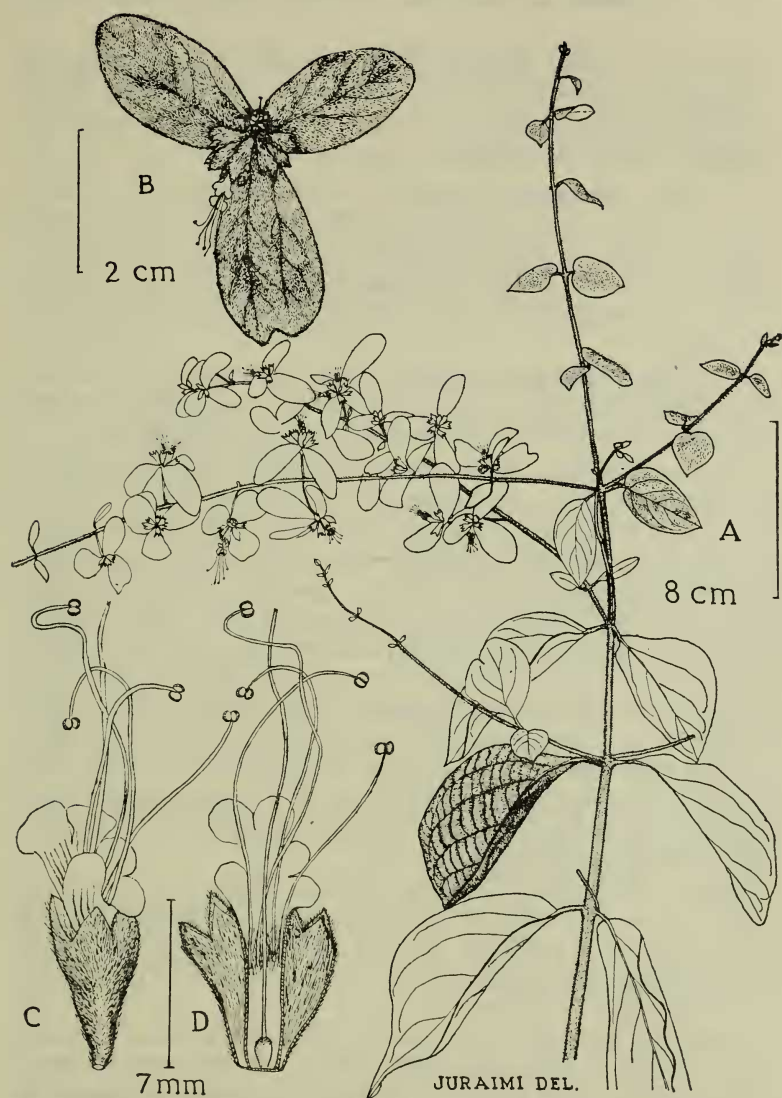


Fig. 10a. *Congea tomentosa* var. *nivea* (Noor & Munir 5 in SING holotype).

A, Fertile twig. B, Cyme to show the shape of the involucral bracts. C, Flower. D, Flower vertically cut open to show its internal structure.

& E); Korat, Baw Rai, (Kerr 9,516: BM, E & K); South-eastern Chanturi, Fong Nam Raw, Kradak (Bunpheng 1,126: BKF). **Prachinburi**, near Sriracha (Collins 2,073: BM & E).

LAOS: **Cammon Province**, Thom (Petelot 3,852: A); Thok (Petelot 3,853: A). **Bassin du Se-Moun**, (Joseph in herb. Alleizette s.n.: L).

CAMBODIA: **Nord Kampot** (Poilane 14,639: A); montagne de l'Elephant, (Poilane 23,271: A). loc. incert. Evrard 2,459: SING).

VIETNAM: **Cochinchine**, Tra Vinh (Poilane 2,413: A & B). **Annam**, quang Tri (Poilane 11,695: B & UC).

CULTIVATED: **Singapore**, Botanic Gardens (Furtado s.n.: Intro. no. 119/1938: SING; Munir 4: SING; Holttum s.n.: SING; Noor & Munir 5: SING, **holotype** & A, B, C, E, G, K, L, LAE, MEL, PNH, NY, UC & US). **Indonesia**, Bogor Botanic Gardens, X.G. 62 (Soepadmo 1: L & SING); XV.E. 78 & 78a (Dilmy s.n.: L).

This variety sometimes produces violet colour on the underside of the involucre bracts or even above in young stage, but this colour does not persist or become obscure in dry specimens.

C. oblonga in Herb. Paris was not available to me. However, a specimen (in Herb. A) of Poilane 23,271, distributed from Paris as "*C. oblonga* Pierre *nom. nudum*" and quoted by Dop (1936) himself as identical with the species, agrees with the original description. Obviously the holotype consisted of a specimen with undeveloped flowers, a reason why Dop did not describe the corolla. Further the species is described as bearing 3-flowers to a cyme, a condition I have found only in the adult stages of *C. forbesii*. In young stages of many species the cymes may be 3-flowered or the smaller buds might be overlooked. However, in Poilane 23,271 (in Herb. A) shows 5-flowered cymes. The only difference one can find is the very narrow leaves, much narrower than in *C. tomentosa* var. *nivea* which may be a result of the ecological position of the branch, whether hanging or not.

Poilane 14,639 from Cambodge at Nord Kampot (in Herb. A) appears to be the same form, and through the undersurface of leaves it seems to link with the type of *C. tomentosa* var. *nivea*. This specimen is practically of the same locality as Pierre 5,229, the holotype of *C. oblonga*.

I have not been able to examine the holotype of *C. peteloti* (Petelot 3,852-a). However, Petelot 3,852 — a specimen collected on the same date and place and identified by Moldenke himself as the species, leaves no doubt as to the identity of the taxon. It is described correctly as having sessile flowers though Moldenke does not state whether the corolla tube is longer than the calyx or not.

Fletcher (1938) adopted the binomial *C. tomentosa* Roxb. (type var.) to designate almost exclusively the specimens of var. *nivea*, while the specimens cited under var. *azurea* are all typical *C. tomentosa* Roxb. Dop referred the specimens of this variety and of *C. pedicellata* to *C. vestita*.

Index to Collectors' numbers

Collectors' names are in alphabetical order and their collections are in numerical order. The number in brackets refers to the number given to each taxon.

- ABDUL HUK 208 & s.n. (10).
 ALLEIZETTE 5723 & s.n. (8);
 s.n. (5); s.n. (10a).
 ANDERSON s.n. in 1868 and
 s.n. in 1875 (10).
 AUBRET & GAGE s.n. (10).
 BAKER 36,411 (3).
 BAKHUIZEN 285 (3).
 BALAPURE s.n. in 1956 (10).
 BA PE 804 (7).
 BEDDOME 6,530 (9); 6,531, 6,533
 & s.n. (10).
 BERNARD X.P.L.I. (10).
 BOOM 38,552 (10).
 BRANDIS 878 & 880 (10).
 BRITTON & BOYNTON 8,165 (10).
 BUNPHENG 472 (10); 1,126 (10a).
 CABILUNA 92,025 (3).
 CANDLER s.n. (10).
 CANICOSA 9,636 (3).
 CHIN 4,366 (10).
 COLLET 48 (10).
 COLLINS 359 (10); 569 (5);
 2,073 (10a); s.n. (3).
 COWAN 244, 802, 1,679, 1,899,
 2,377 & s.n. (10).
 CURTIS 2,903 & 2,962 (3).
 DESHMUKH s.n. (10).
 DICKASON 3,142, 5,662, 6,869 &
 6,927 (10).
 DILMY s.n. (3); s.n. (10a).
 DJIMAT Tatong 2,000 (3).
 DOLMAN 21,509 (4a).
 DUGUE 1,595 (10).
 DURAND 7,204 (3).
 EAMES in 1948 (10).
 EKMAN 9,963 (10).
 ERLANSON 5,368 (10).
 ESBEN 34,293 (3).
 EVRARD 2,459 (10a).
 FALCONER 2 (10).
 FORBES 1,567 (4).
 FORREST 1,144, 9,586, 29,388 &
 s.n. (10).
 FULTON sub WATT No. 10,770 (10).
 FURTADO s.n. in 1927 (3) & (10) &
 in 1938 (10a).
 GALLATLY 13 (10).
 GOOSSENS 4,511 (3).
 GRIFFITH 898 (9); K.d. No. 6,012/1
 (3); sub-K.d. No. 6,013 (10);
 6,014 (9); 9,331 (10).
 HAINES 5,776 (10).
 HALLIER 247 (3).
 HAMID 3,769 (6).
 HANIFF 3,858 (3).
 HARMAND 139 (8).
 HELFER sub-Prague Bot. Mus.
 No. 28 & Bohemiae Herb.
 No. 53 (10); sub-Kd.. No. 6,013
 (10); K.d. 6,014(9).
 HODGE 3,654 (10).
 HOLTUM s.n. (10a).
 HOSSEUS 370 (10).
 INDIAN BOT. SURVEY No. 379 (7).
 JAAMAT & KASIM 15,225 (3).
 JACK 8,486 (10).
 KADIR 35,802 (3); 38,803 (4a).
 KASIN 162 (10).
 KEITH 2 (6).
 KERR 533 & 6,368 (10); 6,810 (5);
 9,516 (10a); 10,166 (7); 12,470,
 14,762, 16,656 & 17,466 (3);
 17,913 (5); 19,792 (7).
 KHANT 82 (10).
 KING s.n. (10).
 KINGDON-WARD 9,049 & 20,514 (1);
 21,729 (10).
 KLOSS 6,703 (6); s.n. (9a).
 KURZ 1,039 & 2,398 (10).
 LACE 2,176 & 2,724 (10); 4,802 (9);
 6,146 (1a); 5,591 (9).
 LAKSHNAKARA 491 (10).
 LARSEN 8,723 & 9,167 (7).
 LARSEN & HANSEN 6,636 (10).
 LISTER 89 (10).
 LOBLE s.n. (10).
 LORZING 11,949 (3).

- MACGREGOR 1,120 (10).
 MARCAN 1,550 (10a); 2,529 (7).
 MAUNDERS s.n. (10).
 MCKEE 5,986 (10).
 McLELLAND s.n. (10).
 McMILLEN 201 (10).
 MEEBOLD 14,047(10); 14,078 & 16,999 (9).
 MG KAN 260 & 270 (10).
 MOKIM 25 & s.n. (10).
 MOLDENKE 9,454 (9) & (10)
 [The two mounted on one sheet.]
 MOORE 6,007 (107).
 MUNDUL 86 (10).
 MUNIR 3 (3); 4 & 5 (10a).
 NAKKARAN 82 (10).
 NATIVE 3,810 (10).
 NOOR in 1918 (10).
 NOOR & MUNIR 5 (10a).
 PACHMAN 116 (9).
 PADAICHER s.n. (4a).
 PARKER 2,161 & 2,393 (7); 2,579 (6).
 PARKINSON 13,930 & 15,700 (10).
 PARRY 609 (10).
 PETELOT 1,539 (10); 3,852 & 3,853 (10a).
 PHENGKHLAI 175 (7).
 PIERRE s.n. (8).
 POILANE 2,413 (10a); 11,674 (8); 11,695 (10a); 13,683 (8); 14,693 (10a); 19,977 (10); 23,271 (10a).
 POOLL s.n. (4a).
 POTTINGER s.n. (10).
 PRAIZER 36 (10).
 PROUDLOCK 36 (3a); 44 (9).
 PUT 2,101 (10a); 2,283 (10).
 RAIZADA s.n. in 1941, s.n. in 1942 & s.n. in 1953 (10).
 RIDDLEY 6,993 (4a).
 RIVERA 33,460 (3).
 ROCK 1,677 (2); 1,691 & 1,923 (10).
 ROGERS 406 (9); 597 (10).
 SANGKHACHAND 757 (7).
 SMITH 55 (3); 306 (5); 314 (7); 650 (3).
 SMITINAND 14,087 (5).
 SMITINAND & ABBE 6,371 (8).
 SNAN 99, 913 & s.n. (3).
 SOEPADMO 1 (10a).
 SOW 34,622 (3).
 SPARE 37,314 (4a).
 SPIRE 749 (10).
 STEINER 22,801 & 22,931 (3).
 SULIT 8,313 (3).
 TALBOT 103 & 648 (8).
 TERUYA 544 (3).
 THOREL 2,639 (8).
 TOPPIN 2,557 (10); 4,225 & s.n. (1).
 TSAI 25,611 (1).
 VANPRUK 163 (10).
 VISSER C90,401 (3).
 WALLICH 1,733, 1,733a/ & 1,733 1/ (10).
 WANG 72,678 (10).
 WATT 16, 5,055, 5,105 & Herb. No. 10,770 (10).
 WEISTE X.P.L.I. (10).
 WIGHT sub-K.d. No. 2,305 (9); in 1,882 (10).
 WOLFE & KADIR 21,455 (4a).